American Journal of Public Health
and THE NATION'S HEALTH

Volume 37 November, 1947 Number 11

The Place of Nutrition in a Public Health Program*

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THE study of nutrition has extended over a longer period than the 75 years covered by these meetings of the American Public Health Association, and both our countries have made material contributions to the advancement of this branch of knowledge. Though much fundamental research still remains to be done, we now know enough to enable us to say how various population groups should be fed if health is to be maintained and, indeed, made more robust. This is of the first importance, for good nutrition easily heads the list of objectives in a public health program.

The recent world war made it necessary for Britain to prepare a plan for national nutrition—no easy task for a country that, with its present density of population, cannot possibly be self-supporting. It was decided that the Ministry of Health should be responsible for advising the Government on nutritional policy from a scientific point of view and that the Ministry of Agriculture should endeavor to produce food, and the newly created Ministry of Food to import and distribute food, in accordance with such advice. We had an interdepartmental committee of officers that worked quietly behind the scenes and insured that no conflicting advice would be offered to the Ministers concerned.

The requirements of the various sections of the population were defined in terms of nutrients and the amounts of different foods necessary to supply these nutrients were estimated. Production and import programs were planned accordingly. Thus the newer knowledge of nutrition was applied for the first time, on a nation-wide scale, to the feeding of the people in Britain.

Practically everyone in Britain was employed on war work of one kind or another, and wages were reasonably high. The manufacture of all goods except those strictly necessary was prohibited, so people had little else than food on which to spend their earnings—and often not too much of that. The position is much the same today.

The main steps taken by Government were as follows:

1. *Subsidies*—It was essential for us

* Presented before the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 7, 1947.

to produce as much food at home as we could, therefore subsidies of all sorts were given to farmers.

Again, food had to be sold at prices comparable with those existing before the war; otherwise wage increases would have got out of hand. Accordingly much of the food purchased by Government at fairly high prices abroad was sold to the public below cost.

In 1946–1947 some £345 million were spent by the Government on these subsidies. Had they been removed, the cost-of-living index, which in the middle of that year stood some 31 per cent above the September, 1939, figure, would have been about 55 per cent above. The food index alone would have increased from 22 per cent to about 60 per cent above that of the immediate pre-war period.

2. *Rationing*—Rationing began in January, 1940. It was based on the principle that all essential foods, even if in short supply, should be equally available to everyone to an extent necessary to maintain health, and at controlled prices. The foods so dealt with were meat, bacon, cooking fat, butter and margarine, cheese, tea, sugar, and preserves.

At the end of 1941, what was known as the "points" scheme was introduced. Every person was entitled to a certain number of points monthly in exchange for which he could purchase a number of articles of food in short supply such as canned meat, fish, fruit and vegetables, and certain cereals. This scheme added palatability and variety to an otherwise rather drab diet and was made possible largely by the generous help of the people of North America.

In 1942 a "personal points" scheme gave everyone a small personal allocation of candies—I along with most other fathers benefited but little from this gesture.

Other foods such as milk and eggs were not rationed but were controlled to this extent, that the public could purchase only the amounts advertised from time to time. Milk frequently fell as low as two pints per person per week. Bread was never rationed during the war—though it is now.

3. *Communal feeding*—In the latter part of 1940 local authorities were encouraged to establish what were called "British Restaurants" at which substantial meals could be obtained at cost price without the surrender of any coupons. Similar canteen arrangements were extended to factories and these were subsequently made compulsory in factories where more than 250 persons were employed. This arrangement was criticised by some who thought that no food should be provided in a communal eating place without the surrender of coupons. It was never intended, however, that the basic industrial ration should meet the needs of those who were working often at hard and unaccustomed tasks away from home. A good mid-day meal at such establishments went far to relieve the household supply, and was eaten mainly by those who really needed the additional food. At the same time an extra ration of cheese was made available for workers for whom canteen facilities were not available, such as those working on the land or in coal mines. There are still more than 800 of these "Civic Restaurants," as they are now called, in operation by local authorities and more than 12,000 factory canteens.

4. *Priority classes*—These were pregnant women, nursing mothers, and children up to school-leaving age. The schemes devised for these groups were known as the Welfare Foods Service and the School Milk and Meals Service. Invalids were also given special privileges and their requirements were attended to by a Special Diets Advisory Committee of the Medical Research Council. All these schemes are still in being.

The Welfare Foods Service is concerned with mothers and with children under 5 years of age. As soon as a woman knows she is pregnant she draws a ration book for her unborn child, on presentation of a certificate from a doctor, a midwife, or a public health nurse. She is then entitled to 7 pints of milk a week at less than one-third the market price, or free if she cannot afford to pay. She may also obtain free cod liver oil or vitamin A and D tablets and, for a small payment, a supply of concentrated orange juice. Additional eggs and meat are also allowed her. After the baby is born the mother and child between them may get as much as 14 pints of milk a week, together with vitamin supplements, until the child is a year old. After that the allowance is 7 pints of milk a week for the child till he is five years old and, of course, the normal vitamin supplements. Up to the age of 2 years the child may have national dried milk if it is preferred, as well as an extra allocation of eggs.

So far as milk is concerned the scheme has been about 100 per cent successful, but the "take up" of the orange juice, the cod liver oil, and the vitamin tablets has not been so satisfactory.

When the child reaches school age, i.e., 5 years, he loses the welfare foods but is entitled to the School Milk and Meals Service. He gets ⅓ pint of milk in school in the middle of the morning and another ⅓ pint in the afternoon if he wants it. Unfortunately the afternoon milk has had to be discontinued temporarily on account of shortage of supplies. In addition, between the ages of 5 and 18, he is entitled to ½ pint of milk at home every day at the full price. All school milk is now free—over 92 per cent of children in public and private schools are having it.

The school children's milk amounts to about 50 million gallons a year. If this is added to the welfare milk, the total is 230 million gallons of free or cheap milk for mothers and children, representing about 40 per cent of all supplies.

School dinners in special school canteens are being rapidly extended. At present just over 50 per cent of children attending State-aided schools benefit, but it is intended as soon as may be to provide dinners free for all school children—just now a charge is made for the cost of the food only, roughly about 5d. a meal. Every effort has been made to provide dinners of the highest possible nutritional standard. Extra meat, fat, sugar, and skimmed milk powder have been allowed and the calorie value of the meal for the older children is about 1,000, for the younger 750.

A scheme of family allowances has been introduced in Britain; for each child except the first the parents receive a cash allowance of 5/- a week. There was a considerable demand for a bigger cash allowance but, rather than agree to this, Government decided to give additional benefits in kind by maintaining permanently the Welfare Foods Scheme and the School Milk and Meals Scheme.

5. *Fortification of food*—Margarine had vitamins A and D added to it in January, 1940, to bring its value up to that of summer butter. Later on the amount of vitamin D was increased. This vitamin was also added to national dried milk in 1945 as a safeguard against rickets. Flour has not been fortified. Instead, we have had a national loaf made of 80 to 85 per cent extraction flour, with some calcium added to neutralize the effects of phytic acid, which apparently interferes with the absorption of calcium and iron.

6. An educational campaign on a large scale was undertaken by Government—through the press, on the radio, on the movies, and by local leaflets and demonstrations—to tell the public about the foodstuffs available and how best to

use them. This was an essential element in the Government program and was generally much appreciated.

EFFECTS OF THE WARTIME FOOD POLICY

1. *Consumption of food*—Before the war the consumption of the more expensive and nutritionally more valuable foods rose with income. The poorest families were generally those with large numbers of children and among them the consumption of those valuable foods was lowest. The war altered this. Full employment with good wages and food subsidies, together with controlled prices, made it possible for even the poorest families to secure a good diet.

Here are some comparisons of 1945 with the period 1934–1938:

Milk	consumption	rose	by	30	per	cent
Potatoes	"	"	"	58	"	"
Bread	"	"	"	21	"	"
Vegetables	"	"	"	22	"	"
Sugar	"	fell	"	33	"	"
Meat	"	"	"	23	"	"
Fats	"	"	"	20	"	"

2. *Health*—The war seemed to offer a wonderful opportunity to establish the value of various methods of assessing the nutritional state of samples of the population. We had generous help from the Rockefeller Foundation in this connection, and numbers of elaborate surveys based largely on laboratory technique were undertaken. I wonder how much we have learned from all these. For my part I think the clinical assessments carried out by my good friend and your well known expert, Dr. Sydenstricker, were of more practical value than many of the complicated studies made in Britain and on the continent of Europe.

Anyhow, for what they are worth, here are some of the results of such surveys and assessments as we could make with the means at our disposal:

a. Clinical examination revealed malnourishment in less than 1 per cent of a large sample of the population.

b. A survey carried out by the Medical Research Council of 16,000 people of all ages and occupations showed, from hemoglobin estimations, a decline in the incidence of anemia in women and children.

c. In 1940–1941 the growth rate, i.e., the height and weight increases, of children aged 4–14, was lower than before the war. By 1943, however, the rate was better than pre-war, and this improvement has been maintained up to 1946.

d. *Dental caries*—I think it is generally accepted that the incidence of dental caries is considerably influenced by diet. I have no figures for the country as a whole but here are the results of careful dental inspection of school children in Cambridge and in London. In Cambridge, in 1938, the percentage of temporary teeth found to be carious was 21.5 and only minor changes were recorded in 1939, 1940, and 1941. In 1942, however, the figure was 14.3, in 1943 it was 13.9, and in 1944 it had fallen to 10.8.

In London, Lady Mellanby made careful surveys of the dental condition of comparable groups of 5 year old children in 1929, 1943, and 1945. She found that between 1929 and 1943 a great improvement had taken place both in the structure of the deciduous teeth and in their resistance to decay. In 1943, 22 per cent of the children were "caries free" as compared with about 5 per cent in 1929. In 1945 she found the individual teeth significantly better in structure and with less caries than in 1943 while the percentage of carious teeth showing arrest of the disease was almost twice as large in 1945 as in 1943. She attributes the improvement to the increased calcifying properties of the diet particularly of pregnant women, infants, and young children. She has just told me that the improvement was still maintained in 1946.

e. *Vital statistics*—The work of Stuart, Burke, and their colleagues in Boston, and of Ebbs, Tisdall, and others

in Toronto, and of the People's League of Health in England, showed that the health of mothers and of infants and the incidence of complications in pregnancy and childbirth are influenced for good by improvement in the mother's diet. We did what we could, as I have told you, to apply these findings on a nation-wide basis. We did what we could, also, to secure as good conditions as possible for women during the antenatal and lying-in periods, though our good intentions were apt at times to be disturbed by bombs and rockets. Here are the relevant figures for England and Wales for 1945 as compared with those for 1938:

1. Maternal mortality (excluding abortions) declined by 46 per cent — excluding infection the decline was 38 per cent.
2. The stillbirth rate declined by 28 per cent.
3. The infant mortality rate declined by 13 per cent.
4. The neonatal mortality rate declined by 13 per cent.

In 1946 the fall continued in all these rates and each of the new figures was the lowest ever recorded. I have no doubt whatever that these results are due in the main to the priorities in essential foodstuffs granted to the mothers and children of Britain under a wise system of wartime rationing.

The fate of adolescents, heavy manual workers, housewives, and single persons living without canteen facilities was not so good. It is not too good now for the non-priority classes after more than two years of so-called peace. Nutrition is not merely a matter of calories and vitamins. There are associated indefinable psychological elements as well. It is hardly surprising that a presumably victorious nation whose whole resources were expended on the war effort should experience some degree of psychosomatic disorder when, at this late stage, its bread has had to be rationed and whose belt has had to be tightened yet another notch or two. All this will pass, of course, and better days will come. We have at least this to be thankful for—and here I quote the words of Lord Woolton, a great Minister of Food—spoken in 1942: "I think we shall be able to say when the war is over that as a result of the application of scientific knowledge to food we have enabled the next generation, which has to build a new age and which indeed has a formidable task before it, to approach the work with healthy bodies. I believe we shall go through this war with no malnutrition amongst the children of the nation. That is one of the things for which we are working and praying, and I hope we shall succeed."

For my part, I hope I have shown you that we have succeeded.

Courtesy of the New York News

Waiting to be vaccinated, New Yorkers form line outside of the Brooklyn Headquarters Building of the Department of Health.

An Outbreak of Smallpox in New York City*

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THE OUTBREAK

ON February 24, 1947, Eugene Le Bar, a 47 year old merchant who had lived in Mexico for six years, started a bus trip from Mexico City to New York City. Ordinarily, such an occurrence would not merit any particular attention, but in this case, it initiated a chain of events that led to headlines in papers throughout the country, hourly bulletins on the radio, laboratories working on a 24 hour schedule to produce vaccine, and hundreds of thousands of people standing on line for hours in order to enter a health center, hospital clinic, or police precinct. The arrival of a sick man in New York City caused millions of people to be vaccinated.

Le Bar was apparently well when he entered the bus, but that evening he became ill. The symptoms were rather mild, consisting of little more than headache and pain in the back of his neck. Two days later he developed a rash. In order to relieve the headache, he took large amounts of a proprietary headache powder as well as aspirin. He arrived in New York City on March 1 and registered at a midtown hotel. Although he was not feeling well, he did a little sightseeing and also walked through one of the large department stores.

On March 5, he entered Bellevue Hospital where he remained until March 8. Because of the rash, he was transferred to Willard Parker Hospital, the communicable disease hospital in Manhattan. There, four diagnoses were considered—drug eruption, erythema multiforme, Kaposi's varicelliform eruption, and smallpox. Smallpox was rejected as the diagnosis because there was denial of exposure to the disease, a well developed vaccination scar, and an

* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 8, 1947.

atypical rash. Le Bar had a successful vaccination in childhood and an unsuccessful one about a year previous to his leaving Mexico. Biopsy of the skin lesions was done, but no Guarnieri bodies were seen in formalin-fixed material. Later when the diagnosis of smallpox had been made in contacts, other sections from the same biopsy material showed the characteristic Guarnieri bodies of smallpox.

The diagnosis of toxic eruption due to a drug was made because the patient had taken medication which often causes a rash in susceptible individuals. On March 10 he died, and at autopsy multiple hemorrhages were found throughout the viscera. The liver was soft and friable, the spleen was large, and there were hemorrhages in the medulla of the adrenal glands. The lungs were also hemorrhagic, and on microscopic section alveolar hemorrhages were noted.

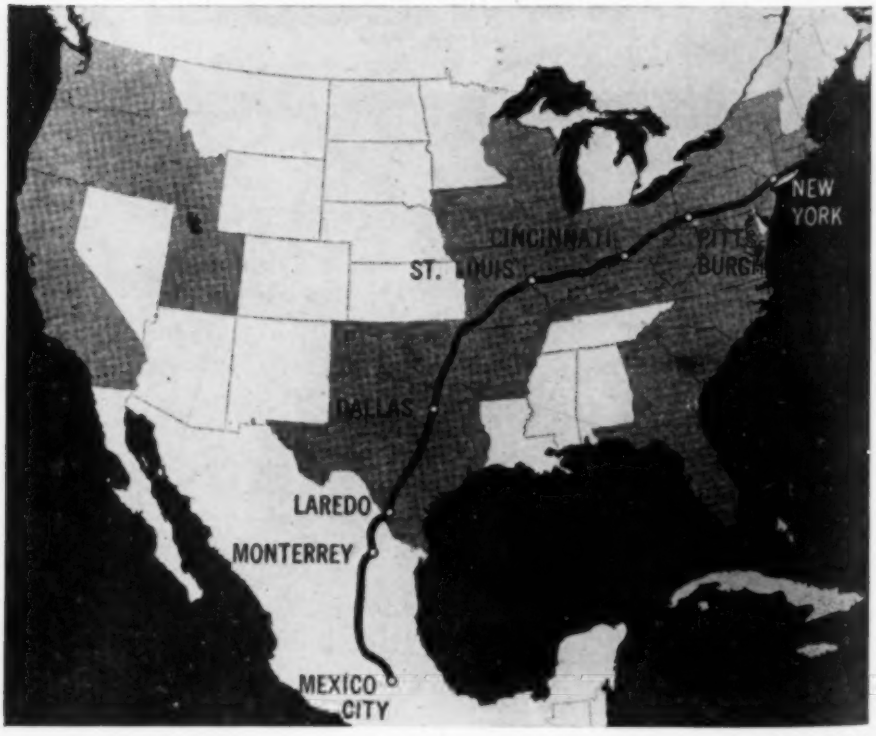
Among the patients who were in Willard Parker Hospital at the same time as Le Bar were Ismael Acosta, age 27, with mumps, and a 22 months old girl suffering from croup. Neither of these patients had ever been vaccinated, and both were discharged from the hospital upon recovery from their illnesses. On March 19, the girl developed a rash and on March 21 was readmitted to Willard Parker Hospital with a diagnosis of chickenpox. On March 22 Acosta, who was working at Bellevue Hospital, also developed a rash and was admitted to the dermatology ward of that hospital. On March 27 he was transferred to Willard Parker as a case of possible chickenpox.

Because in neither instance did the rash appear to conform to that of chickenpox, a tentative diagnosis of smallpox was made. This diagnosis was later confirmed by Dr. Joseph Smadel at the U. S. Army Medical School Laboratory and Dr. Robert F. Parker at Western Reserve University. Fluid

The New York Times

Vaccinations being given at the Headquarters building of the Department of Health. For more than two weeks emergency clinics were operated throughout the city.

World-wide incidence of smallpox, 1946.



Courtesy of Life

Disease might have spread to 29 states (shading) if potential carriers had been infected. Line from Mexico to New York is Le Bar's bus trip.

taken from the pustules of the two patients had been sent to them for laboratory examination. The material had been inoculated into the chorio-allantoic membranes of chick embryos. The report received showed that the membranes were covered with numerous lesions characteristic of smallpox infection. Complement-fixation of these membranes against a known positive anti-vaccinal rabbit serum was strongly positive.

The moment that smallpox was suspected, all employees and patients at the Willard Parker Hospital were vaccinated. The case of Eugene Le Bar was carefully reviewed, further study of the skin lesions was made, and the diagnosis of smallpox was established. It was now evident that he had been the source of infection for the other two cases. All of them had been in the same building, Le Bar and the baby on the ground floor and Acosta on the seventh floor. A search was made for all possible contacts with Acosta and the baby. These were immediately vaccinated, as well as employees and guests still present at the hotel at which the Le Bars had stayed. Guests who had left the hotel were located and were instructed to be vaccinated at once.

A boy 2½ years of age, never vaccinated, who was in Willard Parker Hospital for whooping cough during Le Bar's stay, developed a rash on March 27. The diagnosis of smallpox in this case was confirmed by the laboratory.

On April 6, Acosta's wife, age 26, was admitted to Willard Parker Hospital with fever. She developed a rash the next day, and died of smallpox on April 12. Although Mrs. Acosta was vaccinated as soon as it was known that her husband had smallpox, she apparently had already contracted the disease.

Three men, ages 43, 57, and 60, all patients at Bellevue Hospital when Acosta was there, developed rashes on April 10, 11, and 13. A diagnosis of smallpox was made in each of these cases and the patients were removed to Willard Parker Hospital.

A 4 year old boy who was discharged from Willard Parker on March 10, the day of Le Bar's death, went to a convalescent home in Milbrook, N. Y. While there, he developed a rash which was subsequently diagnosed as smallpox. He was the source of 3 other cases at the home—a nun, age 62, a 5 year old boy, and a 2 year old girl. Thus the outbreak consisted of 12 cases, 9 originating in New York City and 3 in Milbrook, N. Y. Of the 9 in New York City, 2 died.

THE VACCINATION CAMPAIGN

The diagnosis of smallpox in the case of Acosta was confirmed by Dr. Smadel in a telephone call from Washington, D. C., on April 4, 1947. The U. S. Public Health Service was immediately notified and steps were taken by them to trace the route of the bus on which the Le Bars had traveled, in order to discover whether additional foci of infection had been set up. Mrs. Le Bar was located by the U. S. Public Health Service in Maine, where she had gone after her husband's death. Fortunately, she had been vaccinated against smallpox when she visited her husband at Willard Parker Hospital. She was in good health and had a successful vaccination. Follow-up along the bus route revealed that there were no cases of smallpox in those areas traceable to Le Bar. A plan for vaccinating all the people in the city was drafted by Health Department officials in conjunction with Commissioner of Hospitals Dr. Edward M. Bernecker and members of his staff. The Health Department's Bureau of Laboratories was placed on an emergency work schedule. A statement concerning the situation was given to the press, and messages were broadcast

1. A.—27 years old—smallpox on eighth day of the disease.

Infant 22 months old—smallpox on tenth day after onset.

over the radio urging all New Yorkers to be vaccinated without delay. Vaccination clinics in the Health Department headquarters building, in all Health Department health centers, and in the city hospitals were kept open day and night, seven days a week.

Two hundred and fifty thousand individual doses of smallpox vaccine were available for immediate distribution by the Health Department laboratories. Bulk for an additional 400,000 units was on hand. The Bureau of Laboratories began immediate packaging of the bulk, permission having been granted by the U. S. Public Health Service to put this vaccine up in vials containing fifty doses each. The United States Army and Navy sent several hundred thousand units of vaccine gathered from all parts of the country. Since millions of units were needed to vaccinate the people in New York City, and this amount was not available, Mayor O'Dwyer called an emergency meeting at his office. Present at this meeting were representatives of the manufacturers of vaccine, members of the Health Department staff, and Dr. Thomas M. Rivers, Director of the Rockefeller Institute for Medical Research, and member of the Board of Health. At the urgent request of the Mayor, the manufacturers went on a 24 hour schedule packaging their bulk vaccine and diverting all available supplies to this city. Retail pharmacists coöperated in distributing vaccine to private physicians. Vaccine supply stations were set up at a centrally located police precinct and at the Health Department.

Vaccination stations were set up in all police precincts, in addition to Health Department buildings and municipal hospitals and clinics. There was a total of 179 city installations being used for vaccination. Practically every hospital in the city set up a special clinic where vaccinations were given to all who applied, free of charge. The vaccine was furnished by the Health Department and was administered by doctors on the hospital staff. Many community organizations set up local centers staffed by volunteer physicians and clerks. Labor and industry cooperated by establishing vaccination stations in factories, offices, and union headquarters. In some cases, their own physicians did the vaccinating; in others, it was performed by Health Department personnel. The stations maintained by the city remained open from 9 a.m. until 10 p.m., including Saturdays and Sundays. On April 26, those at the police precincts were discontinued, and on May 3 all other stations were closed.

In a period of less than a month more than 6,350,000 people were vaccinated in New York City, over 5,000,000 of them within the two week period following the appeal for universal vaccination made by the Mayor. Never before had so many people in one city been vaccinated in such a short time and on such short notice. Thanks are due to the press and radio for giving so generously of their space and time to bring necessary information to the public. Had it not been for them and for the intelligent coöperation of the public and the generosity of private physicians and volunteer workers, notably from the American Red Cross and the American Women's Voluntary Services and former Air Raid Warden groups, it would have been impossible to have achieved this remarkable record.

WHAT MIGHT HAVE HAPPENED

The introduction of virulent smallpox into a community, especially a large cosmopolitan city with rail, ship, and air connections with the rest of the nation and many parts of the world, could be a major catastrophe. For example, in 1945 in the Puget Sound area around Seattle, there were 65 cases of

smallpox and 20 deaths. These cases were all attributable to a soldier stationed in Japan who had developed smallpox aboard ship en route to Seattle.

During the period 1900 to 1929, epidemics of virulent smallpox were reported throughout the United States. Notable among these were the outbreaks in 1921 in Denver and Kansas City, when the former city reported 924 cases and 37 deaths, and the latter 943 cases and 160 deaths. In 1924, Detroit reported 1,610 cases and 163 deaths. In 1901, an epidemic of smallpox in New York City resulted in 1,959 cases and 410 deaths. Had the same rate prevailed in the 1947 outbreak, there would have been 4,310 cases and 902 deaths.

All of the cases of smallpox that occurred in New York in April, 1947, were of the virulent type which usually has a fatality rate of 40 per cent in children and 20 per cent in adults. Because of the virulence of the disease and its high communicability, it is little short of remarkable that there were only 12 cases in the entire outbreak.

One of the most difficult problems facing health officials is the control of the spread of the disease through unrecognized mild cases in persons who have retained some immunity from vaccination in infancy. These mild missed cases can be the source of virulent smallpox in unvaccinated persons and in those who have completely lost their immunity from former vaccinations.

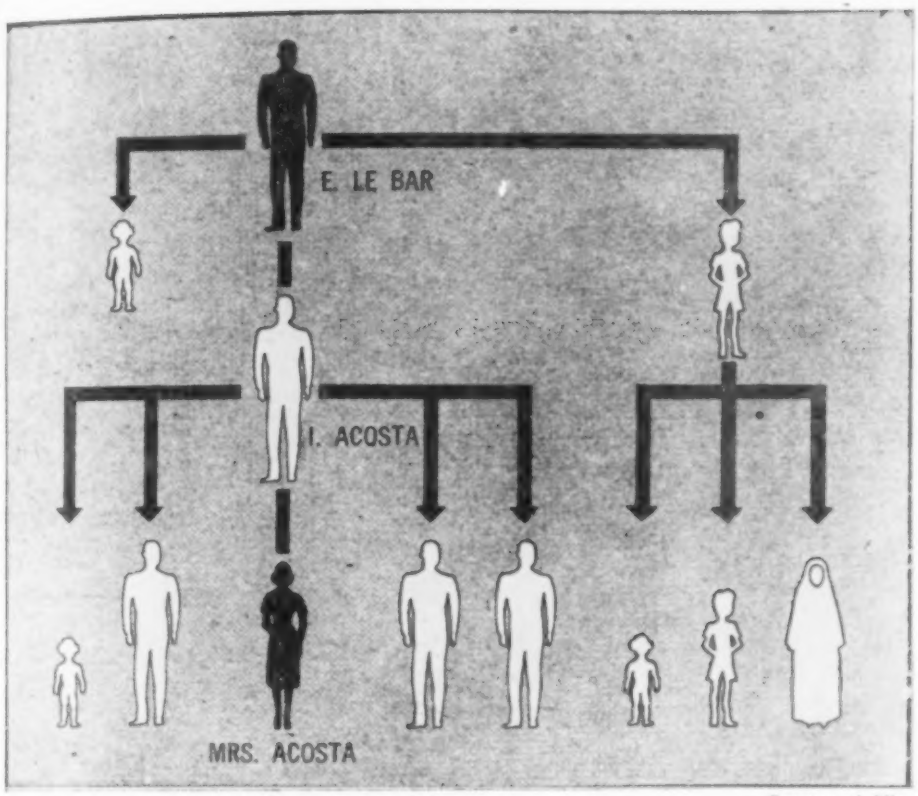
VACCINATION AND IMMUNITY

Of the 12 patients in the recent outbreak, only 3 had ever been vaccinated. These 3 had received protection more than forty years previously. There is no evidence that any person has a natural immunity to the disease. The length of time that immunity lasts in a vaccinated individual varies considerably. It may be just a few months or many years. The soldier who brought smallpox to Seattle in 1945 was returning from the Pacific theatre of war and had been vaccinated as were all persons in the armed forces. Many individuals in New York City who had been vaccinated only a few years before the present outbreak had accelerated reactions when revaccinated, and in some cases, primary takes. Several physicians reported that children, 2, 3, and 4 years of age, who had been vaccinated in infancy, showed primary takes when revaccinated. It is therefore apparent that whenever a case of smallpox occurs in a community, the only safe procedure is for every person in that community to be vaccinated without delay. The vaccination procedure recommended and practised by the Health Department was the multiple pressure method.

SEQUELAE

Whenever a large-scale vaccination program is undertaken, there is always the possibility that there may be some unfortunate complications. Every health officer is aware of this, but also knows that it is a risk which must be taken if there is to be universal protection.

Rumors run riot during a vaccination campaign. Many persons with chickenpox or with simple skin eruptions are thought by their friends to have smallpox. The Health Department received innumerable telephone calls reporting cases of smallpox, which upon investigation proved to be chickenpox. Likewise, many people who, several days after they had been vaccinated, became ill with any one of a variety of symptoms, called the Health Department to find out if the vaccination was responsible. In New York City, there are thousands of people who become ill, and about two hundred of them die every day. Since practically every person in New York City had a recent vaccination, it was inevitable that some of them would become ill and would die. Vac-



Courtesy of Life

Disease spread from Eugene Le Bar to Ismael Acosta and two children. Acosta in turn infected his wife, who died, and four others. One child who was infected by Le Bar passed virus to two children and a nun in Millbrook, N. Y.

cination does not stop the normal course of events. Neither should vaccination be blamed for a death from cerebral hemorrhage, nephritis, or coronary occlusion.

It is well known that encephalitis occasionally follows vaccination. When it is due to vaccination, it almost invariably occurs 11 to 14 days later. It may occur up to 30 days later, but this is exceedingly rare. From the beginning of April, when the vaccination program was instituted, until the second week of June, 50 possible cases of encephalitis were reported to the Health Department. Four of these cases were ruled out as definitely not encephalitis. In the remaining 46 cases, the diagnosis was considered probable. Eight of these 46 individuals died.

A diagnosis of post-vaccinal encephalitis can be made with certainty only after microscopic examination of the brain tissue. Brain tissue of the 8 fatal cases was examined, and in none of them were the characteristic lesions of post-vaccinal encephalitis found. Autopsy showed that 2 of the deaths were caused by tuberculous meningitis, 1 by a brain tumor, 1 by coronary sclerosis, and 4 probably by cerebral lesions. The Health Department has had no proof of any death due to post-vaccinal encephalitis in its vaccination campaign.

Although none of the cases of encephalitis was found to be associated with vaccination, 3 deaths did occur from other complications. A 66 year old man died as a result of septicemia

which followed an infection of the vaccination. Two infants, age 8 months and 4 months, who had eczema, developed generalized vaccinia as a result of contact with persons who had been recently vaccinated.

Tragic as these incidents were, it must be borne in mind that had vaccination not been carried out on such a large scale, there very likely would have been thousands of cases and hundreds of deaths.

CONCLUSION

Every health officer must be aware that no community can be considered safe from smallpox even though there has not been a case of it for many years. New York City had not had an outbreak for twenty years. Universal vaccination is the only safeguard. The period of immunity conferred by vaccination varies with each individual. Lasting protection can be assured only by periodic revaccination at intervals from five to ten years, always with a vaccine known to be potent and properly administered. Failure to react to a vaccination indicates an impotent vaccine or poor administrative technique. Contrary to popular belief, it does not indicate that the person is immune. Just as soon as a case of smallpox is suspected in a community, every effort must be made to have everyone vaccinated without delay.

Control of Cross-Infections in Infants' Wards by the Use of Triethelyene Glycol Vapor*

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THE problem of prevention of cross-infections in infants' and children's wards is a serious one.[1, 2] Solution is made difficult by the lack of information concerning the relative importance of various means by which pathogenic organisms may be acquired. The air-borne route is recognized as one of the important modes of spread of etiological agents causing secondary respiratory tract, skin, and wound infections in hospitals. Four methods have been employed to keep the bacterial and virus content of the air in wards below the infective level. These are (a) increased ventilation and mechanical barriers,[3, 4] (b) dust suppression by the treatment of floors and bedclothes with oil,[5–10] (c) ultra-violet irradiation,[1, 11–19] and (d) chemical disinfection of air with glycol vapors.[20–23, 26–31] Several investigators have reported limited success in reducing cross-infections in children's wards by means of irradiation of the air, but mechanical barriers, dust suppressive measures, and chemical disinfection with glycol vapors have not been evaluated in this respect.

In 1941 Robertson and associates first reported laboratory studies on the germicidal properties of propylene glycol when dispersed into the air as aerosols and vapors.[20, 21] Since this time, studies by various members of the Commission on Air-borne Infections under the direction of Robertson have been concerned with (a) further observations on the disinfecting properties of glycols, particularly of triethylene glycol vapor,[22, 32, 33] (b) the mechanism of germicidal action of these compounds,[23–25] (c) the toxicity of glycols on repeated injection and on continuous inhalation by rats and monkeys,[23, 34] (d) the development of apparatus for the vaporization and control of the glycol vapor in the air,[35–37] (e) physico-chemical properties of glycol vapor in the atmosphere which influence the extent of its condensation on bacterial droplets,[38–40] and (f) the bactericidal activity of triethylene glycol vapors in the atmospheres inhabited by human beings under different conditions of

* Presented before the Epidemiology Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

This investigation was supported by funds from the Commission on Air-borne Infections, Army Epidemiology Board, Office of the Surgeon General, Army United States, the Research Corporation, New York City, the Johns Hopkins University, and the University of Chicago.

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temperature, relative humidity, and dust control.[26–28]

Likewise, several reports by Bigg and coworkers since 1944 have dealt with the (a) development of apparatus for the dispersion of glycol vapors,[41–43] (b) the possible fire hazards connected with the use of glycols as germicidal agents,[44] (c) the lethal action of glycol vapors on spore-forming bacteria[45] and fungi,[46] and (d) the epidemiological observations on the use of triethylene glycol vapors as a means of controlling respiratory tract infections among military personnel.[47, 48] Other workers in this country,[49–52] Canada,[53] and England[54] have studied various aspects of the problem of the use of glycol vapors for the disinfection of air.

The present study was organized to evaluate further the use of triethylene glycol vapor as an air disinfecting agent for the prevention of cross-infections in hospital wards. Although previous studies by the Commission had demonstrated that the maximum effectiveness in ridding the atmosphere of bacteria is obtained when the action of glycol vapor is supplemented by dust control measures, it was decided to use only glycol vapor in this test, in order to assess the usefulness of this method alone. Because of the high incidence of cross-infections and the opportunity to control the activities of the patients, infants' wards were considered most suitable for conducting such an investigation. At the invitation of Dr. Edwards A. Park, the present study was made on the infants' wards of the Harriet Lane Home, Johns Hopkins Hospital. The investigation extended from November 15, 1945 to May 1, 1946.

MATERIALS AND METHODS

Wards—The test (east) and control (west) wards were comparable in size and shape (20 x 60 ft.). Each was divided into cubicles with walls extending from the floor to a height of approximately 7 ft. (6 ft. 10 in.) Space was provided for 16 beds in the test and 18 in the control ward. The wards were heated by hot water and ventilated by opening windows. Figure 1 is a sketch of the test ward, showing, by numbers, the cubicles and the position of the apparatus employed in the maintenance and control of relative humidity and glycol vapor concentration in the air.

Maintenance and Control of—

a. *Relative Humidity and Temperature*: The apparatus employed was that developed and previously used by the Commission on Air-Borne Infections during studies on the control of the bacterial content of the air in Army hospital wards.[26–28, 36, 37] An instrument for recording continuously the wet and dry bulb temperatures * was installed in both wards. Adequate humidification of the air of the wards was secured by introducing steam from the heating pipes after passage through a suitable muffler. A solenoid valve placed in the steam line and controlled by a Friez humidostat regulated the steam output to maintain a relative humidity of 40 per cent. One such humidifying system sufficed for the control ward, but two were needed for the test area in order to provide sufficient water vapor promptly in the vicinity of each glycol vaporizer. The temperature of the wards was controlled by opening the windows and manually turning radiators off and on.

b. *Concentration of glycol vapor in the air*: Two Research Corporation Glycol Vaporizers † were employed in the test ward, placed one on each side of the large utility room as shown in Figure 1. Appropriately placed fans mounted near the ceiling produced an even distribution of water and glycol vapors throughout each space. To avoid a direct draft on

* Taylor Instrument Company, Chicago, Ill.

† A single vaporizer of this size would have been sufficient if the ward had not been constricted by the utility room.

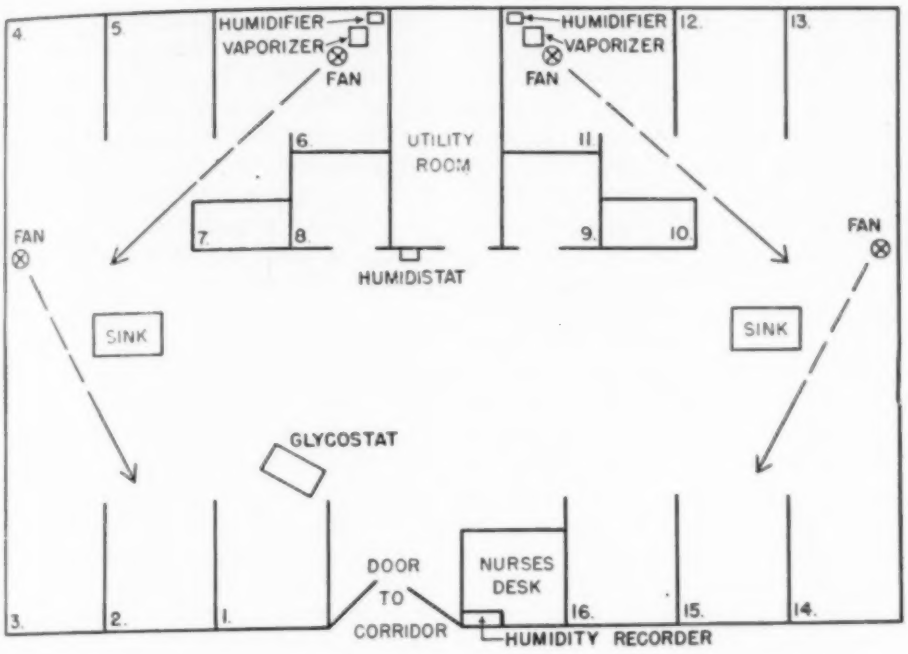

FIGURE 1—Test ward showing cubicle arrangement and position of apparatus for maintenance and control of relative humidity and glycol vapor concentration in the air

the infants, these fans* were run at moderate speed and directed slightly upward. The direction of the air currents is shown by the arrows in Figure 1. The number of fans required for adequate mixture of the ward atmosphere was at least twice that needed for an unobstructed space. The output of the vaporizers was regulated by means of a glycostat which was placed in the room as shown in Figure 1. An Esterline-Angus milliammeter connected with the glycostat gave a continuous record of the concentration of triethylene glycol vapor in the air which was maintained below the fog level. The only occasions that a glycol fog occurred despite glycostat control were when the relative humidity was increased by the sudden release of large quantities of steam from the sterilizers in the ward utility room. Atmospheric supersaturation with glycol under these conditions was due to the fact that as the relative humidity increases the amount of glycol vapor capable of being held in the air decreases progressively until finally condensation occurs.[23–25]

Bacteriological Methods—During the course of study, frequent surveys were made of the bacterial flora of the nasopharynges of the infants, noses and throats of the hospital personnel, and air and dust of the wards. Particular attention was paid to the presence of group and type-specific beta-hemolytic streptococci and type-specific pneumococci. Close attention was also directed toward the presence and spread of a previously undescribed respiratory tract pathogen of the Friedlander-aerogenes group, a Gram-negative bacillus, which "quelled" in types 23 and 32 pneumococcal typing sera.

a. *Patients*: Two nasopharyngeal cultures were obtained from each infant on admission and one, thereafter, on every Monday and Thursday, and one at the time of discharge. All patients devel-

* Reynolds Fan Company, Chicago, Ill.

oping secondary infections of the respiratory tract, skin, and wounds were also cultured. The nasopharyngeal cultures were taken in the following manner: A small copper wire swab, moistened in fresh beef-heart infusion broth * to which 2 per cent defibrinated sheep blood was added, was inserted first through one nostril and then the other nostril into the nasopharynx. It was allowed to remain there for 10 to 15 seconds, removed, smeared on a blood (5 per cent sheep) agar plate, and inserted again into the blood broth. The blood agar plate was streaked in the laboratory. Both broth and plate cultures were incubated for 18 hours at 37°C. The plates were examined for beta-hemolytic streptococci. If present, they were picked and transferred to tryptose phosphate broth for grouping and typing after the manner of Swift, Wilson, and Lancefield.[55]

All broth cultures were examined by direct typing for pneumococci and Gram-negative bacilli. Negative cultures were injected intraperitoneally into mice (½ ml.) which, if they did not die, were killed in 48 to 72 hours and the peritoneal contents examined for the above organisms. Both broth and plate cultures were made from skin and wound lesions with the swab technique, after which they were examined in the above manner.

b. *Hospital personnel*: Nose and throat cultures were taken routinely once a week on the professional staff, nurses, and ward attendants. For several weeks, from January through March, nose and throat cultures were taken on visitors (parents, friends, etc.).† The cultures were then examined as described above for pneumococci, hemolytic streptococci, and Gram-negative bacilli.

c. *Environment*: Semi-weekly bacteriological analyses of the air on the test and control wards were made employing the Folin-bubbler-sampler [56] and blood-agar open plate, methods previously used by the Commission on Air-borne Infection in other studies.[26–28] The samples were taken on the test and control wards on consecutive days (Monday and Tuesday, Thursday and Friday), usually from 7:30 a.m. to 9:30 a.m., during the period of maximum activity, such as bed making, bathing, and feeding of infants, and floor sweeping.

At the time of taking the air cultures, two Folin-bubbler-samplers were set up simultaneously, one at each end of the ward. Each sampler was run for 20 minutes, pulling air through it at the rate of 1 cu. ft. per minute. A total of from 10 to 12 such samples were taken during one morning's run. Aliquots of the bubbler broth were then plated for total bacteria (0.5 ml.) and for hemolytic streptococci (2.0 ml); 1-750,000 Gentian violet was added to the latter to inhibit the growth of other organisms.[57] Gentian violet was added to the remaining broth which was incubated for 18 hours at 27°C. and inoculated intraperitoneally into mice for isolation of pneumococci.

Open blood agar plates (without gentian violet) were placed on the bedside tables and exposed to the ward air for 1 hour (7:30 to 8:30 a.m.) and others containing gentian violet were exposed from 7:30 to 11:30 a.m. Counts for total bacteria as well as for hemolytic streptococci were made, and the latter picked for grouping and typing. Streptococci picked from the plates were inoculated into blood broth, and incubated at 37°C. for 18 hours, after which 0.5 ml. of the culture was inoculated intraperitoneally into mice for the isolation of pneumococci. The specific encapsulated Gram-negative bacillus referred to

* Containing gentian violet 1-750,000. This concentration showed no germicidal effect on pneumococci, hemolytic streptococci, or the Gram-negative bacillus.

† Visitors were admitted to the ward only on the day of admission and once a week on Sundays from 2:00 to 3:00 P. M.

above grew also on the gentian violet plates as a mucoid translucent colony. These colonies were counted, picked, and set up directly in types 23 and 32 pneumococcal typing sera for identification.

Ward Technique of Handling Patients—In so far as possible, an aseptic technique was followed when caring for the infants. Gowns, hung in the open ward at the entrance of each cubicle, were worn by the nurses and attendants when the infants were fed, dressed, changed, and had their beds made. Masks were also worn when very young infants were handled. Gowns were changed and hands washed thoroughly before and after caring for each patient. Attendants with upper respiratory infections were isolated during the acute phases of illness or required to wear masks while on the wards. In the case of emergencies and during ward rounds these techniques were not always carried out.

Patients—Infants from 1 day to 2 years of age were admitted to the wards with a wide variety of medical and surgical illnesses. There were 130 patients in the control and 140 in the test wards who stayed a sufficient length of time (5 days) to be included in the study. They were admitted, as far as possible, alternately to the test and control wards. In a few instances, some cases were shifted purposely from one ward to another. As shown in Table 1, the mean age of the patients and the time spent in the hospital were comparable on the two wards.

Approximately half of the patients had respiratory tract or skin infections at the time of admission. The results of the admission nasopharyngeal cultures are shown in Table 2. There were only 3 cases admitted to the wards with cultures positive for hemolytic streptococci. Actually, one of the cases on the test ward was a transfer from the control ward with the positive culture. The majority of the infants showed positive cultures for one or more types of pneumococci. The most prevalent types, which made up approximately 50 per cent of the strains isolated, were 6, 14, 19, and 23. Twenty-four additional pneumococcal types were isolated (Table 2).

TABLE 1

Comparison of Experience of Patients with Respect to Age and Time Spent in Hospital

Wards	*Control*	*Test*
Total admissions	130	140
Total hospital days	2,402	2,221
Mean number of days per patient	18.5	15.2
Mean (months) age on admission	7.6	7.3
Age (months) distribution of hospital days on ward		
25 per cent under	3.0	3.2
50 per cent under	7.0	6.1
75 per cent under	10.7	9.2
25 per cent over	10.7	9.2

TABLE 2

Admissions with Respiratory or Skin Infections and Positive Nasopharyngeal Cultures for Pneumococci, H. Streptococci and Specific Gram-negative Bacillus

Wards	*Control*	*Test*
Total Admissions	130	140
Admissions with Respiratory or Skin Infections	54	48
Nasopharyngeal Cultures		
Beta Hemolytic Streptococci (group A, types 2, 33)	1	2
Gram-negative Bacillus	2	1
Pneumococci (different strains)	67	96
Per cent most frequent		
Pneumococcal Types (6, 14, 19, 23)	55	44
Per cent (24) additional types	45	56

Sulfonamide and Antibiotic Therapy—Soon after the study began it became evident that consideration would have to be given to the use of sulfonamides and penicillin on the wards. These drugs, although of great benefit to the patient because of their antibacterial activity, constituted a factor which must be considered in the analysis of the findings if the experience of the two wards was to be compared. Accordingly, the experience of the patients in each of the two wards was divided into: (a) hospital days with no chemotherapy, and (b) hospital days with chemo-

therapy. This allowed not only a comparison of the effect of the triethylene glycol vapor, but also gave some measure of the role of these antibiotics in the prevention of new infections while on the wards.

An analysis of the experience of the two wards with respect to the use of antibiotics is shown in Table 3. It will be seen that 40 per cent of the experience of the patients on the control ward and 45 per cent of the experience on the test ward was with chemotherapy. This difference has been adjusted for in the analysis where the infection rates have been calculated per 1,000 hospital days, with and without chemotherapy (Table 5).

TABLE 3

Comparison of Total Hospital Days of Patients to Days on Chemotherapy or Antibiotic Therapy

Wards	*Control*	*Test*
Total number of patients	130	140
Total hospital days	2,402	2,221
Total days no Chemotherapy	1,442	1,236
Total days on Chemotherapy	960	985
Penicillin alone	491	572
Sulfonamides alone	281	264
Penicillin and Sulfonamides	165	149
Streptomycin	23	0

RESULTS

Vaporization of Triethylene Glycol—Vaporization of triethylene glycol was begun on the test ward November 7, 1945, and discontinued April 25, 1946. Observations on the incidence of secondary infections developing in the two wards were begun November 15, 1945, and continued until May 1, 1946. The concentration of glycol vapor in the air of the test ward varied from 55 per cent to 70 per cent.* Only on one or two occasions was the glycol apparatus turned off for more than a few hours during the whole period of study. The longest interval (8 hours) occurred at night when a bulb in the glycostat burned out and was not replaced until the following morning. The consumption of triethylene glycol was approximately 200 ml. per day.

Effect of Glycol on Personnel, Patients, and Ward Environment—There were no major complaints from the attendants, nurses, or doctors who worked on the ward from a few days to several months. One or two nurses complained of headaches as a result of working on the ward when a visible glycol vapor fog was present. It was impossible to control the temperature adequately on the test ward and on occasions it would go as high as 85°F. with a R.H. of 40 per cent. At such times the ward was uncomfortably warm. There was no evidence of toxic effect on the respiratory tract or skin of infants who lived on the test ward from a few days to several weeks.

Due to the frequent release of large quantities of steam from the ward utility room, described earlier, glycol condensed on the windows and walls, which caused dirt to accumulate over a period of time. The condensation on walls and ceilings was greatly accentuated by the impingement of air currents from the four fans necessary to produce adequate mixing of the air in this constricted space. The unusually heavy dust content of the air added to the deposition of dirt. It should be pointed out in this connection that earlier installations of triethylene glycol in wards of similar size but having free circulation of air and a constant relative humidity were accompanied by no visible condensation of glycols on the walls or ceilings.[26-28]

Bacterial Content of the Air—The bacterial content of the air on the test and

* Some trouble was encountered in the operation of the glycostat due to the marked dustiness of the ward air. It would gradually lose its sensitivity because of the accumulation of dirt on the reflecting surface of the rotating wheel. This made it necessary to reset the controls every two or three days to maintain the glycol concentration at the sub-fog level and to clean the glycostat about every ten days. On occasions, when the glycostat did not function well, it was set so that a visible fog was maintained to insure an adequate disinfecting concentration of glycol vapor in the air.

TABLE 4

Comparison of Environments of the Wards and the Bacterial Content of the Air

Wards	*Control*	*Test*	*Per cent Reduction*
Number of days on which air samples were taken	43	43	..
Mean number of patients	14.7	13.8	..
Mean relative humidity	36.6	40.0	..
Mean per cent saturation of triethylene glycol	0.	60.0	..
Mean number settling plates exposed for 1 hour (8 to 9 a.m.)	11	11	..
Mean number bacteria per "settling plate"	149	103	31
Mean number cubic feet of air sampled (Folin-bubbler-sampler)	215	220	..
Mean number bacteria per cubic foot of air	90	26	70

TABLE 5

Incidence of Infections Developing on Test and Control Wards in Relation to Chemotherapy

	Control Ward			*Test Ward Triethylene Glycol Vapor*		
	Chemo-therapy	*No Chemo-therapy*	*Total*	*Chemo-therapy*	*No Chemo-therapy*	*Total*
Total Hospital Days →	960	1,442	2,402	985	1,236	2,221
A. Clinical infections:						
1. Nonspecific (URI) number	11	15	26	6	9	15
Rate per 1,000 hospital days	11.4	10.4	10.9	6.1	7.5	6.7
2. Specific bacterial number	2	18	20	2	9	11
Rate per 1,000 hospital days	2.1	12.4	8.3	2.0	7.5	4.9
B. Inapparent bacterial infections:						
Number	13	28	41	13	24	37
Rate per 1,000 hospital days	13.5	19.4	17.1	13.2	19.4	16.6

control wards was analyzed on 43 different days during the period of study. As shown in Table 4, the mean number of patients, mean relative humidity, number of settling plates exposed, and number of cubic feet of air analyzed by the Folin-bubbler-sampler were essentially the same on the test and control wards. The mean per cent saturation of triethylene glycol vapor on the test ward was 60 per cent during the days of air sampling.

There were 31 per cent less bacteria recovered from the air of the test ward employing settling plates, and 70 per cent less employing the Folin-bubbler-sampler, than were recovered by these techniques, from the air of the control ward. The variation in the number of air-borne bacteria obtained from the air of the wards during the period of study is shown in Figure 2. There was no apparent reduction in the number of group A type 33 hemolytic streptococci in the air when an infant with generalized eczema, secondarily infected with these organisms, was placed on the glycol ward.[58] The extent of contamination of the environment by the "tracer" organisms will be given in separate reports.[58, 63, 64]

Infections Developing on the Wards—All infections which developed in the infants on the two wards during the study period were classified as follows: a. *Clinical infections*: These included all infections accompanied by two or more objective signs such as coryza, stuffy nose, red throat, red ear drums, draining ear, diarrhea, or vomiting; as well as those with symptoms of illness such as fever, fretfulness, or convulsions. Clinical infections were subdivided into nonspecific and specific infections, depending upon whether or not it was possible to recover one of the three pathogens (pneumococci, hemolytic streptococci, or specific Gram-negative bacilli) from the nasopharynx, skin, or wound lesion. b. *Inapparent or non-clinical infections:*

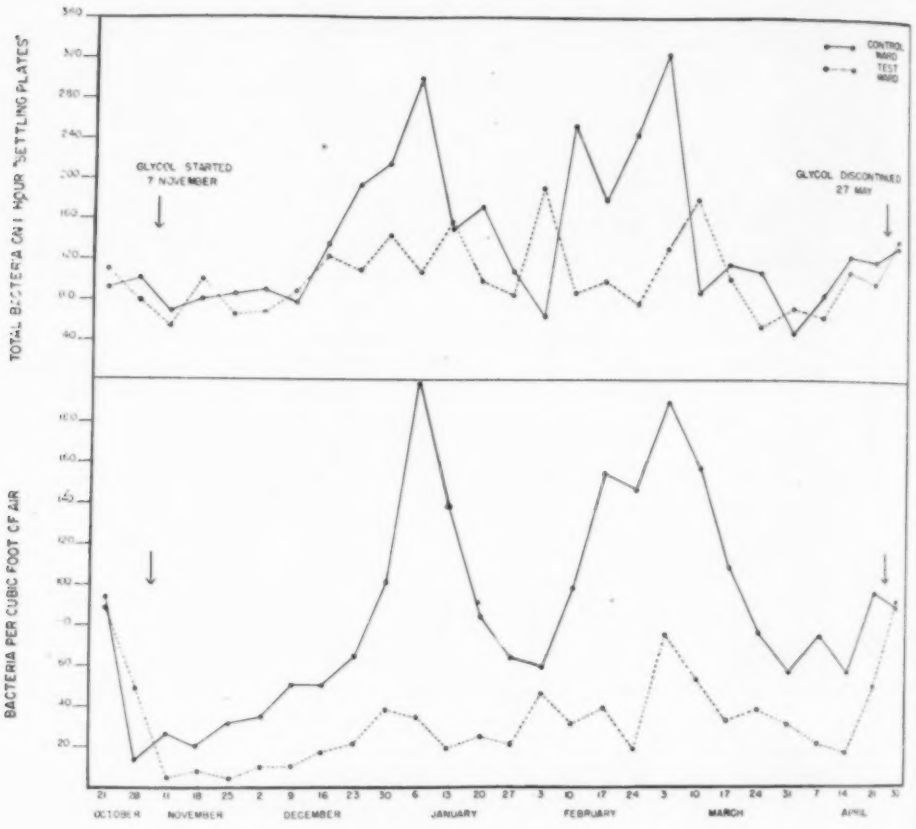

FIGURE 2—Weekly bacterial counts from the air of test and control wards employing blood agar open "settling plates" (above) and Folin-bubbler-samplers (below)

These included all cases where there were no clinical manifestations of illness, but a pneumococcus, hemolytic streptococcus, or specific Gram-negative bacillus not previously isolated from the case was cultured during the semiweekly swabbing of the nasopharynx.

Table 5 compares the incidence of infections developing on the two wards during the course of the study. A comparison of the rate per 1,000 hospital days for nonspecific clinical infections shows a slight margin in favor of the test ward. Thus, rates of 6.1 and 7.5 per 1,000 were recorded in the test ward for those receiving and not receiving chemotherapy respectively as against comparable rates of 11.4 and 10.4 on the control ward. These differences, however, are no greater than could be expected to occur by chance. It is interesting to note that this type of infection was only slightly, if at all, influenced by chemotherapy.

Specific bacterial infections occurred at the same rate among those receiving chemotherapy on the two wards. Among those not on chemotherapy the rates were 12.4 and 7.5 for the control and test wards respectively. This difference is well within the range of chance variation and no conclusions as to the efficacy of triethylene glycol vapor in preventing this type of infection is warranted on the basis of these results. It should be noted, however, that with bacterial in-

TABLE 6

Comparison of Nonspecific and Specific Bacterial Cross-infections

Wards	*Control*	*Test*
I. Clinical Infections:		
A. Nonspecific (URI) Infections (total)	26	13
B. Specific Bacterial Infections:		
1. Otitis media (unspecified)	1	2
2. Otitis media (hemolytic strept. type 33)	1	1
3. Upper respiratory infections due to:		
Pneumococci (type specific)	7	2
Hemolytic Streptococci, group A, type 33	2	2
Specific Gram-negative Bacilli	4	1
4. Meningitis (pneumococcus type 25)	1	0
5. Skin (hemolytic streptococcus type 33)	3	1
6. Wound (hemolytic streptococcus type 33)	1	0
7. Bronchopneumonia (organism unidentified)	0	2
Total	20	11
II. Inapparent Infections due to:		
A. Hemolytic Streptococcus (type 33)	6	2
B. Pneumococcus (15 different types)	20	17
C. Specific Gram-negative Bacillus	15	18
Total	41	37

fections the incidence was significantly lower on both wards among those receiving antibiotics.

No differences were observed in the incidence of the inapparent infections on the two wards, nor was there any significant reduction in the occurrence of these infections due to administration of chemotherapy.

In Table 6 are listed the number and kinds of infections occurring on the test and control wards from which the data given in Table 5 are derived.

DISCUSSION

The apparatus employed in dispersing and controlling the concentration of glycol in the air of the test ward functioned satisfactorily during the period of study. This is shown by the fact that 70 per cent less bacteria, using the Folin-bubbler-sampler, were recovered from the air of the test ward than from that of the control ward. This reduction is essentially the same as that (60 per cent) reported by Hamburger, Puck, and Robertson [26-28] in the streptococcal content of the air, when similar apparatus was employed in hospital wards in Army camps. Combining dust suppressive measures with glycol vapors for the disinfection of air, they reduced the streptococcal count in the air of the test ward over 90 per cent, compared to counts attained during the control periods. No data are available as to the degree of reduction of air-borne pathogenic bacteria necessary to bring about a lowered incidence of infection.

In the present study, dust suppressive measures (oil to bedclothes and floors [9, 10]) were not employed. This is reflected in the lack of any striking effect of the glycol vapor on the bacterial content of the air as shown by the open plate counts. On the basis of the probable mechanism of germicidal action of glycol vapors,[23-25] it would not be expected that the bacteria in the larger particles which quickly "settle out" of the air onto the exposed blood-agar plates would be killed by the germicidal vapors. Thus, as pointed out by these investigators, oiling procedures should be employed along with the glycol vapors for the latter to function most satisfactorily.[26, 27]

Bigg and associates [47, 48] have applied the technique of chemical disinfection of air with glycol vapors to the problem

of control of respiratory diseases among military personnel. They compared the incidence of infections in a group of men (324) sleeping in glycol-treated quarters over a 6 week period, with the incidence among a control group sleeping in untreated quarters. Although there were 64 per cent less infections among the men billetted in the glycol-treated quarters during the last 3 weeks of observation, the reduction for the entire period was only 12 per cent. The number of carriers for hemolytic streptococci also became less in the group living in the glycolized quarters.

Harris and Stokes[20-31] observed the effect of propylene glycol vapor and, later, triethylene glycol vapor on the incidence of respiratory infection in a children's convalescent home. During the three year study they observed only 13 infections on the wards during the test periods, compared to 132 during the control periods. As pointed out by the authors, this study was made under highly favorable circumstances. The wards were essentially quiet ones with a limited amount of coming and going of visitors, professional and nursing staff. Very few of the children were acutely ill. Most of them were bedfast, providing very little contact with one another and opportunity for direct droplet spread of infection.

Our study in the infants' wards at the Harriet Lane Home shows no such dramatic results as those reported by Harris and Stokes. However, the conditions for testing triethylene glycol vapors as a means of control of cross-infections were not so favorable. Harriet Lane Home is a teaching hospital for medical students, nurses, a large group of house staff and attending men, and there was continuous traffic by the personnel into and out of the wards for the greater part of the day. Many of the infants were acutely ill and often required intimate care by the attendant, nurse, or doctor. During emergencies, cubicle isolation and aseptic techniques were sometimes broken. This situation existed equally on both the test and control wards. Thus, the conditions under which this study was conducted constituted an unusually difficult test for evaluating the use of glycol vapors for the prevention of hospital infections. Although the incidence of nonspecific and specific bacterial cross-infections was less among the infants on the glycol ward than among those on the control ward, the difference is not statistically significant. As indicated above, there were many opportunities for the spread of infections other than by the air-borne route. Recognizing this, the reduction in clinical infections which did occur on the test ward may represent that proportion which were air-borne and thus prevented by glycol vapor.

The question was often asked by interested visitors during the course of this study, how triethylene glycol vapor compares with ultra-violet irradiation as a means of preventing cross-infections in children's hospitals. Ultra-violet light has been employed for this purpose by McKhann, Steeger, and Long,[1] Barenberg, Greene, and Greenspan,[11] Greene, Barenberg, and Greenberg,[12] del Mundo and McKhann,[13] Sauer, Minsk, and Rosenstern,[15, 16] and Robertson, Doyle, and Tisdall[19] with varying degrees of success. Brooks, Wilson, and Blackfan,[14] on the other hand, report no effect of ultra-violet light in preventing respiratory infections on infants' wards. On the basis of the results of the above studies already cited and those of Wells,[59] Hart,[60] and others, the Council on Physical Therapy voted to accept ultra-violet lamps for disinfecting purposes.[61] Hollaender,[62] reviewing the problem of ultra-violet irradiation, emphasized that further studies following carefully the recommendations of the Council were necessary before this technique of air disinfection could be evaluated accurately. The results of

chemical disinfection of air with glycol vapors are encouraging but many more controlled studies under different ward conditions need be carried out before the relative merits of ultra-violet light and glycol vapors for air disinfection can be evaluated.

Although the extensive use of sulfonamides and penicillin was considered a complication as far as the primary purpose of this study was concerned, it was recognized that the administration of these therapeutic agents was now a general procedure and that they would be widely employed in any future ward study of this kind. The significantly low incidence of clinical, bacterial infections in the groups receiving antibiotics, compared to the rate among those not receiving drugs on both wards, shows that these antibacterial agents also acted prophylactically to prevent the pathogens from invading the host tissues, although they did not prevent implantation on the mucous membranes. Essentially no controling effect by these drugs, however, was observed in the case of nonspecific clinical and inapparent bacterial infections. These observations emphasize that air disinfecting procedures as a means of preventing secondary bacterial infections must also be evaluated in relation to the simple, but sometimes expensive, therapeutic procedure of giving antibiotics for the duration of the child's stay in the hospital.

Space will permit but a brief statement of the epidemiological studies to determine the relative importance of different modes of spread of infections on the wards. Employing the hemolytic streptococcus, pneumococcus, and specific Gram-negative bacillus as "tracer" organisms, it was found that at certain times the ward environment (dust and air) became heavily contaminated with these pathogens. The source was usually found to be one or more of the ward patients with exudative skin infections or purulent otitis media in the case of the hemolytic streptococcus, a chronic sinusitis or bronchitis with considerable nasal discharge and coughing in the case of the pneumococcus, and acute upper respiratory infections and diarrhea in cases where the Gram-negative bacillus was isolated from the throats and stools. Thus, the path of infections appeared to lead from patient to patient and from patient to attendant, nurse, visitor, and doctor. In rare instances was the course of the infection traceable to an adult. The data from which these observations were made will be the subject of separate reports.[58, 63, 64]

SUMMARY AND CONCLUSIONS

A study was conducted on the control of cross-infections by the use of triethylene glycol vapor on the infants' wards of the Harriet Lane Home, Johns Hopkins Hospital, from October 15, 1945, to May 1, 1946. The test and control wards were comparable in size, physical set-up, number of patients, and kinds of primary diseases treated.

The apparatus employed was that used in previous studies by the Commission on Air-borne Infections, Army Epidemiological Board, for the disinfection of air with glycol vapors in hospital wards in army camps. Under the conditions of the ward environments at the Harriet Lane Home, the dispersal and control of the glycol vapor was satisfactory. The extreme dustiness of the ward air (in the absence of the use of dust suppressive measures) necessitated frequent cleaning of the glycostat to insure its proper functioning. During the period of study, the concentration of glycol vapor in the air of the test ward varied from 55 to 70 per cent.

There were no complaints from the attendants, nurses, or doctors who worked on the glycol wards. No injurious effect was noted on the respiratory tract or skin of infants who were on the test ward for several weeks to months.

Employing settling plates and the

Folin-bubbler-sampler, there was a consistent and significant reduction (31 and 70 per cent respectively) in the number of bacteria isolated from the air of the glycol ward when compared to the numbers isolated from the air of the control ward.

On account of the general use of chemotherapy, both for prophylaxis and treatment, it was necessary to consider this factor in the analysis of the data. A comparison of the rate of nonspecific clinical infections (URI) per 1,000 hospital days showed a slight margin in favor of the test ward. The difference, however, was no greater than could be expected by chance. These infections were only slightly, if at all, influenced by chemotherapy.

The rates per 1,000 hospital days of specific bacterial infections among those not receiving chemotherapy were 12.4 and 7.5 for the control and test wards respectively. This difference is within the range of chance variation, and no conclusions as to the efficacy of triethylene glycol in preventing this type of infection is warranted on the basis of these results.

Specific bacterial infections occurred at the same rate among those receiving chemotherapy on the two wards and was significantly lower on both wards than among those not receiving antibiotics.

Many more similarly controlled studies under different conditions of ward environments need be done to evaluate further the use of glycol vapor as a practical means of preventing cross-infections in hospitals and to compare its relative effectiveness with other methods of air disinfection (ultra-violet light and dust suppressive measures) and the prophylactic use of chemotherapeutic agents.

ACKNOWLEDGMENT—The authors wish to express their appreciation for the wholehearted coöperation of Dr. Edwards A. Park, Professor of Pediatrics and Pediatrician-in-Chief of the Johns Hopkins Hospital; Dr. Alan M. Chesney, Dean of the School of Medicine, Johns Hopkins University; Dr. Edwin L. Crosby, Director of the Johns Hopkins Hospital; Helen Schnetzer, Head of Pediatric Nursing, Harriet Lane Home; Drs. Alexander J. Schaffer and Horace L. Hodes, Associates in Pediatrics and Attending Physicians at the Harriet Lane Home, the House Staff, and the Assistant Supervisors of Nursing at the Harriet Lane Home.

The authors also take pleasure in acknowledging the assistance on the wards of Nurses T. Aufhauser and D. H. Sinclair, and in the laboratory of J. Cline, C. M. Gonyea, I. Krimminger, L. V. Nelson, M. H. Ritter, and R. Kley.

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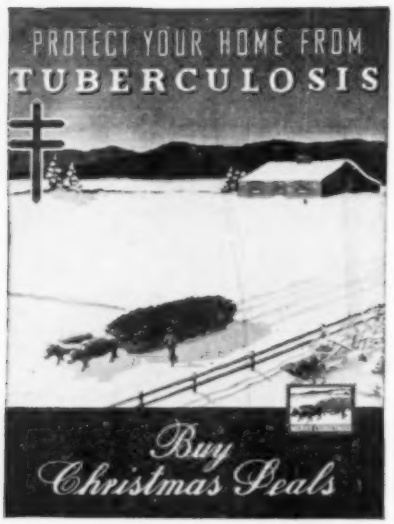

Opportunities for the Engineer in Public Health*

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THE opportunities for the engineer in the field of public health rest upon the need for the sort of service he can do, the analysis of problems, the research, the ingenuity in devising solution, the techniques of applying engineering equipment and methods, all with due regard to good economy and good organization. However, the opportunities for the engineer depend as much, or more, upon his personal characteristics, his imagination, his initiative, his energy, his intelligence, and his attitudes. It is up to him to develop his opportunities, not only as they knock on his door, but as he seeks them out. In the field of public health, the most effective development of an opportunity rests mainly on one personal attribute, a common ingredient in all successful public health workers, whether engineers, epidemiologists, nurses, or others, and that is a public health consciousness.

Not everyone has this attribute. Many public health workers become so immersed in a limited phase of a problem, so intrigued with complications or challenges to their technical ability, that they incline to overlook simple and elementary measures that have an important bearing on public health. Physicians are apt to think in terms of cases, engineers in terms of specialized equipment, and they both may lose sight of a dominant element of their work. Recently, Dr. Haskell, in commenting on factors leading to unsatisfactory results of a milk sanitation program, stressed the need for just plain cleanliness. He stated that although modern milk sanitarians could discourse learnedly on the application of electronics to milk pasteurization, he doubted if more than a small percentage of them could take a milking machine apart and put it together again, and that an even smaller percentage carried with them a rod to probe the tubing. This has a familiar sound. How many engineers understand very thoroughly the action of anion and cation exchangers, who consider it beneath their interest to look for lipstick on drinking glasses or to check the chlorine in the cold water rinse of some beer joint? The public health attitude, the perception of hazards, and the conception of their impact on groups of people, is the first essential in developing opportunities in public health.

The interpretation of the term "public health engineer" is frequently much too narrow. Generally, it is applied to an engineer associated with an official public health agency, who is concerned almost solely with inspection and with the enforcement of laws and regulations. Such a concept does not consider the important contribution of four other groups, without whom the health department engineer would be almost helpless.

First are professionally trained

* Presented before the Engineering Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 10, 1947.

people responsible for the operation of engineering works. The chief operator of a municipal water works, the industrial engineer who runs a plant to remove objectionable pollution from factory wastes, the superintendent of a sewage treatment plant, all make a definite contribution to the protection of the public health. With the official agencies, this group forms a team, each member of which is reliant upon the other for full effectiveness. The health department cannot keep an inspector in every water plant, every sewage plant, every milk plant, or in fact in any such place, all of the time. The operating agency has a responsibility for careful compliance with established health standards, and the excellence of a public health program depends largely upon the excellence of operating personnel. Experience has shown repeatedly that poor operation can nullify the best of planning and an otherwise superior program.

However, another group of engineers is essential to the team—if the health department engineer must depend upon the operator, the operator must in turn depend upon the designing engineer to furnish him with a plant capable of performing its function. The idea is often expressed that a consulting engineer should be required to operate each new plant which he designs for perhaps a year, the reason being that he should develop detailed knowledge of the operator's problems. The idea is good, in that it not only leads toward improvements in design, but also emphasizes the dependence of the operator upon the designing engineer.

Quite a similar relationship exists in the case of the manufacturer of equipment. In fact, in milk pasteurizing plants and food establishments, the equipment people almost entirely supplant the designer, and such establishments are frequently built around more or less standardized units of equipment. Even in the fields of water and sewage treatment, traditionally the stronghold of the consulting sanitary engineer, the overall engineering designs are greatly influenced by choices of equipment. This should stimulate the manufacturer, for it develops an element of competition and new and improved equipment is likely to follow.

Behind all of these groups stands another, which has a profound influence upon the entire field of public health engineering. It is a certain fact that the best trained personnel will turn in the best program and, conversely, poorly trained individuals can wreck a program at almost any point. Great stress is laid upon the educational qualifications of engineers, and upon in-service training of operators; and the proven benefits of this sort of program are very great. The group which furnishes instruction in public health engineering, the teachers in our educational institutions, are a fundamental part of a public health organization and exert a dominant influence throughout the whole field.

The effectiveness of each group, the health department engineers, the operators, the equipment manufacturers, the consulting engineers, and the teachers, increases in proportion to their understanding of and coöperation with all of the others. The teacher who has lost contact with field problems, or the equipment man who does not understand the basic principles of public health, are largely ineffective in promoting a sound program. All together, when motivated by a common goal, namely, the protection of the public health, these several groups can and do form a unified association, each playing a vital part.

With this broad concept of public health engineering, the many opportunities for trained engineers become quite apparent. The opportunity for any one is apt to lie in the field of his

greatest interest and talent. Within each sphere of activity there are many critical problems to be considered. There is need for basic research, some of relatively simple nature, but which has just never been tackled effectively, such as the effect of polluted water on bathers, and with that a sound criterion for bathing water quality. There is need for development and improvement of equipment, as is illustrated in the new technique for disposal of human wastes from railroad passenger cars; there is need for effective training of personnel where opportunities for an effective display of leadership are very great; there is need for constructive activity in all phases of public health engineering, not only in conventional sanitation, but in the fields of malaria control, industrial hygiene, and other areas of environmental sanitation. These and similar opportunities are awaiting constructive development. The highest development can probably be attained by the closest possible association between groups; by a recognition of the principle that one good man can do a good job and another good man can also do a good job, but both together can do more than twice as good a job. That extra factor which is introduced as a result of joint effort is important, particularly when two widely different viewpoints converge upon a single problem.

One public health engineer may be fitted for teaching, another for selling, a third for operation and management, but all will find a sound development and a useful outlet for their abilities if they can keep forever in their minds and attitudes the public health consciousness; that their skill lies, not only in the mastery of complex and difficult problems, but in the ability to perceive hazards to the health of groups of people and to reduce or eliminate such hazards by the application of engineering methods.

An Epidemic of Mild Gastroenteritis of Unknown Etiology Presumably Spread by Contaminated Eating Utensils

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INTRODUCTION

Extent of Outbreak—This is the report of an outbreak of 64 known cases of nausea, vomiting, and diarrhea in a graduate school population of 322 adults of both sexes, of whom approximately 200 eat regularly in one dining hall. The infecting organism is unknown. The information used here was obtained by interview with 44 persons and from questionnaires returned by 112 others. The attack rate was 41 per cent in this group of 156 individuals, all of whom had eaten in the refectory mentioned.

Clinical Findings—During this outbreak, there were 3 cases severe enough to require infirmary admission. Each of these complained of nausea, vomiting, and diarrhea. In addition, 1 had general malaise. Their admission temperatures of 101° F., 104° F., and 100° F., returned to normal in 12, 24, and 36 hours respectively. These 3 cases presented no unusual findings, no evidence of marked dehydration, and, except for fever, no pronounced symptoms of toxicity. Two of these cases were admitted on April 13 and the third on the 18th. For each, symptoms appeared first on the day of admission.

Other than these 3, none of the patients was seen by a physician, although some had been confined to bed.

Chronology of the Outbreak—Data on the dates of onset and symptomatology for all cases are presented in Table 1 and Figure 1. When studying these data, it should be noted that the school had reopened after the spring recess on Thursday morning, April 10, 1947, and that no meals were served in the refectory on Sunday, April 13.

The curve suggests a primary source, or sources, of infection between April 10 and April 12. Nearly two-thirds (61

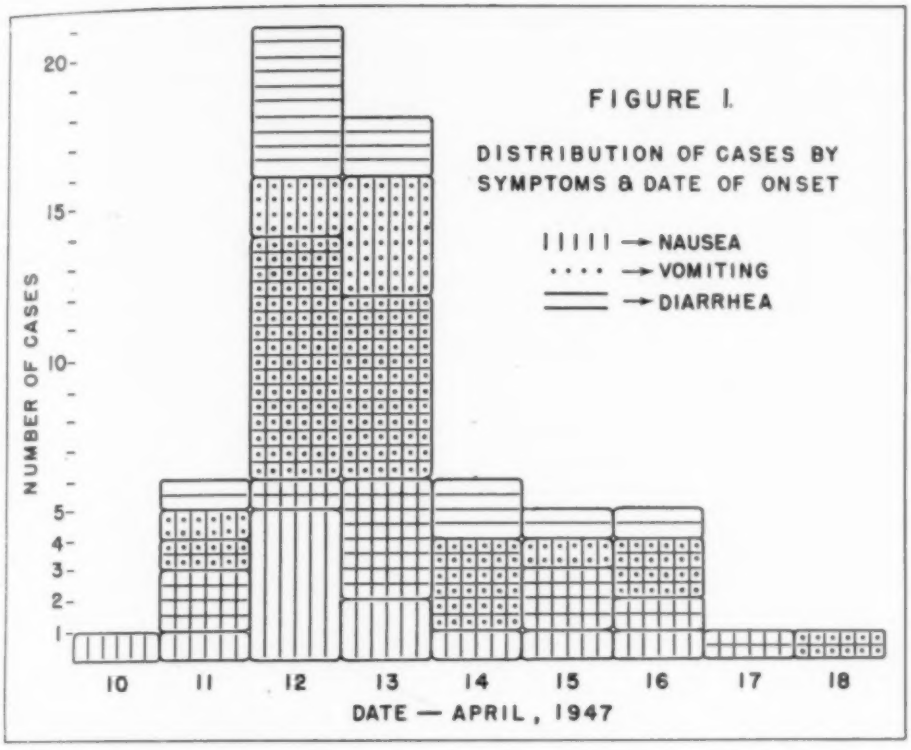
TABLE 1

Date of Onset and Symptoms for Each Known Case

	Date of Onset									
Symptoms	*4/10*	*4/11*	*4/12*	*4/13*	*4/14*	*4/15*	*4/16*	*4/17*	*4/18*	*Total*
N	1	1	5	2	1	1	1	0	0	12
D	0	1	5	2	2	1	1	0	0	12
N & V	0	1	2	4	0	1	0	0	0	8
N & D	0	2	1	4	0	2	1	1	0	11
N V & D *	0	1	8	6	3	0	2	0	1	21
Total	1	6	21	18	6	5	5	1	1	64

Key: N = Nausea; V = Vomiting; D = Diarrhea

* Included in this category are 2 patients who reported vomiting and diarrhea but no nausea



per cent) of the cases occurred on April 12 and 13, 11 per cent on April 10 and 11, and 28 per cent (delayed cases or secondary cases) between April 14 and 18. It does not seem likely, however, that infection at any single meal can have been responsible for the entire outbreak. We do not know the incubation period of this disease; but if we assume 2–38 hours, 39 per cent of the cases could have been caused by infection at the evening meal of April 12; while 34 per cent must have been caused before that meal. Infection at more than one meal on April 11 and 12 seems probable.

General Epidemiological Investigation—Reference to our daily epidemiological records made it clear that there was no concurrent increase in the incidence of gastrointestinal infection elsewhere in the university. Nor was any phenomenon of the kind noted in the community at large. On other grounds, too, there was no reason to suspect generally distributed supplies such as water or milk.

Water for the school is taken from a public distribution system. Treatment consists of storage, slow sand filtration, and break-point chlorination, and the treated water flows by gravity from a covered storage tank. There were no known pressure failures at any point in the distribution system immediately preceding or during the outbreak. Plumbing in the school is comparatively new and is free of cross-connections. Daily bacteriological examinations of water samples collected from the distribution system near the school during April were negative.

On these facts alone, the water supply probably could be ruled out as a possible source of infection. Further evidence to remove the water supply from suspicion arises from the fact that several laboratories, classroom buildings,

TABLE 2

Analyses of Milk Samples from University Supply after Pasteurization

Date	Bulk Supply		Bottled Supply	
	Plate Count *	Coliform †	Plate Count *	Coliform †
4/9	..	0 of 5	..	0 of 2
4/10	..	0 of 5	..	0 of 2
4/11	..	0 of 5	..	0 of 2
4/12	..	..	..	0 of 2
4/14	88,000	2 of 2	44,000	1 of 2
4/15	19,000	0 of 2	11,000	0 of 2
4/16	..	0 of 5	..	0 of 5
4/17	..	0 of 5	..	0 of 5
4/18	..	1 of 2	..	0 of 2

* Standard plate count: Organisms/ml.

† Presumptive test: 1 ml. of inoculum in formate ricinoleate broth

Key: 0 = no. positive tubes

.. = no samples run

and the infirmary in the university proper are served from the same source, yet the outbreak was limited to this one school.

All milk used in the dining hall is pasteurized. Unlike any of the 12 other dining halls, this one is furnished "bulk" milk in 10 quart containers delivered daily. The supplies are otherwise the same. Careful study of the handling of this "bulk" milk revealed no serious shortcomings in technic. Thorough and practically continuous refrigeration of the milk is stressed. Samples of the university milk supply are examined frequently, and the record during the period April 9–18 was good (Table 2).

There is further evidence that the primary source of milk supply was not the vehicle of infection. Part of the milk supply for a local hospital is delivered in 10 quart cans from the same pasteurizer runs as for the school. The cans used are interchangeable and not specifically earmarked for either place. There was no concomitant outbreak of gastroenteritis among the hospital personnel drinking "bulk" milk.

The Possibility of Infection by Food Handlers—Clearly, the source of infection must have been a local one; and presumably connected with the handling of food or utensils. General conditions of cleanliness did not favor the possibility that rats or other vermin could have played a rôle. Contact was not considered to be a likely means of spread primarily because the outbreak involved the gastrointestinal tract and there was no known respiratory disease in this population group at the time of the present outbreak or after it had subsided. Furthermore, the sharpness of the epidemic curve ruled out contact infection as a major factor.

We next, therefore, turned our attention to the problem of the "carrier in the kitchen."

Copies of the menus for all meals served in the 13 dining halls in the university are kept on file and are currently reviewed by one of us. In this instance attention was focused on two meals at which potentially hazardous foodstuffs (cream puffs and chicken salad) were served in the dining hall used by those who had been ill. It was soon evident that some of the patients had not been present at one or the other of these meals, and data subsequently obtained from the questionnaires definitely eliminated each of these meals as the sole focus of infection. Of the group sick at any time during the epidemic there was no single meal at which all ate together.

At the outset of our investigation, it appeared that none of the 11 full-time food handlers had recently been ill. Also, no one of the students employed

part-time in the pantry or dining room was known to be ill. Certainly none had been sick enough to stop working. However, by the end of the outbreak 3 student employees were discovered to have suffered from the prevailing infection. Two of these cases had their onset rather late in the outbreak (on April 14 and 16). The third of these employees, however, was the second case revealed in chronological order, credited in Table 1 to April 11. We shall return to this case in a later paragraph; but he did not handle any food served in the refectory.

During the flare-up, no attempt was made to obtain stool specimens from other than one itinerant employee. Our previous experience with bacteriological studies of similar outbreaks had been discouragingly futile. Dack [1] confirms our belief that there can be no substitute for painstaking epidemiological study in attempting to find the source of a presumably food-borne outbreak.

In this instance the start of our investigation was comparatively late, patients were but mildly ill, and we had no early evidence of the magnitude of the outbreak. In retrospect, our study would have been more comprehensive had we had laboratory help, and we cannot be sure that there would not have been significant findings from a thorough bacteriological work-up.

The Possibility of Infection by Dishwashers—It was intensive study of the earliest cases in the outbreak which ultimately opened up a reasonable explanation. It will be noted that Table 1 contains one entry for April 10. This student (X) became ill at 10 a.m. on that day, the morning that school reopened. He doubtless was infected elsewhere. He had nausea, chills, and "high fever," and was bedridden 3 days in his room.

Although X was not a dining hall employee, he roomed next to Y, the second person ill in the outbreak (the student dining hall employee noted above). Y did not handle food, however, but was responsible for drying dishes and silverware after they were taken from the dishwashing machine at the morning and noon meals. He was nauseated from the morning of April 11 through the 14th, but never vomited and had no diarrhea. He was not bedridden, and did not leave his job.

There were no additional cases until late evening of April 11.

In the absence of any tangible evidence to demonstrate another source and mode of spread, it is suggested that Y is the probable source, and that contaminated dishes or silverware served as vehicles for the spread of the infection.

Further credence may be given to this theory inasmuch as the 11 full-time employees previously mentioned (none of whom was ill) eat the same foodstuffs that are served students, *but the employees' eating utensils are washed, dried and stored separately from those used by students. Y did not handle the employees' utensils.*

Dishwashing Procedure—A mechanical double-tank dishwater is used in this dining hall. There are indicating thermometers on both the wash and rinse water lines, and usual water temperatures at these stages are 142° F. and 170° F., respectively. At the time of our initial investigation of this outbreak the rinse water temperature was 165° F., and trays passed through the conveyor-type machine in 25 seconds. The dining hall supervisor stated that trouble had been encountered recently in keeping the wash water below 145° F., and that frequent adjustment with cold water was necessary. Because of the valve arrangement, the rinse water temperature was lowered simultaneously, but not below 160° F.

It has been the practice to "towel-dry" all eating utensils in the dining halls, primarily because glasses and

dishes otherwise are spotted or streaked. Even though we do not approve this practice, it is our opinion that the methods used are satisfactory. An ample supply of clean, well laundered towels is provided at each meal. Bacteriological analysis of swab samples taken from utensils before and after towelling have revealed no significant changes in counts, and in any event the number of colonies found has been far below the usual standard of 100 per utensil.

In retrospect, a noteworthy fact was recorded at the time of our first inspection on the morning of April 14: A relatively large number of "clean" dishes, stored in warming cabinets, had adherent cooked food particles, principally egg yolk and jam. No particular attention was paid to this finding at the time except to have all dishes rewashed.

All dishes in regular use are stored between meals in uninsulated but bright-walled warming cabinets, heated from steam coils. Steam pressure of approximately 16 lbs. per sq. in. is maintained between 6 a.m. and 10 p.m., and with the cabinets closed the air temperature approximates 150° F.

Previous tests have shown that utensils in closed warming cabinets are subject to bactericidal action, and that counts on such utensils drop approximately 90 per cent when stored 4 hours. However, we were able to demonstrate that a 24 hour broth culture of *Staphylococcus aureus*, when smeared in thin film on a clean, sterile Petri plate, proliferated after 7 hours in a closed warming cabinet of which the air temperature was constantly in the range 149°–158° F. (65°–70° C.). Similar tests made simultaneously with *Salmonella enteritidis* and *Micrococcus caseolyticus* were negative.

In practice, the doors of warming cabinets are frequently left ajar, and occasionally wide open. Although no temperature readings were made in the warming cabinets at the time of the epidemic investigation, dishes could be handled easily, indicating that the temperature was probably well below 150° F.

SUMMARY

An outbreak of 64 cases of acute gastroenteritis of unknown etiology has been described. After sifting all available evidence, it is concluded that the disease was spread by contaminated eating utensils. Data to support this theory are presented.

ACKNOWLEDGMENT — We are grateful to Professor C.-E. A. Winslow and Miss Margaret A. Bowers for their helpful advice and assistance.

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Relation of Certain Cooking Procedures to Staphylococcus Food Poisoning*

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THAT the incidence of staphylococcus intoxication must be considered as one of the ranking problems facing public health workers interested in food sanitation is evidenced by the rapidly increasing number of confirmed cases reported. Much difficulty has been encountered in the laboratory in attempting to elucidate and to harmonize the many facets which the problem presents. This is a report on a study of one of the more practical aspects of the staphylococcus food intoxication problem: an attempt to establish thermal death time-temperature relationships for one strain of staphylococcus in cream filling and to correlate the results thus obtained with the temperatures attained in accepted cooking procedures for cream filling. Bacteriological examination was made of cream filling subsequent to placing it in cream puff pastries. It appeared that information of such a nature might be of some help to public health officials who were interested in the requirements for cooking cream fillings, the re-heating of pastries as a means of protecting the public against illness due to the ingestion of staphylococcus in cream filled products, and the part played by the food handler in the contamination of such products.

The effect of cooking procedures on the survival of staphylococci has been investigated in other laboratories. In 1931 Dack, Woolpert, Noble, and Halliday[1] observed that staphylococci introduced into either sponge or butter cake batter were killed during the baking process. All viable cells seemed to be destroyed when the interior temperature of the sponge cake batter reached 75.2°C. Staphylococci introduced into cream filling were said by these authors to be destroyed during cooking, but no detailed data on this point were presented. Coughlin and Johnson[2] without presenting experimental evidence suggested that in order to prepare custard mix (cream filling) safely it should be heated to not less than 200°F. for 10 minutes, and then cooled promptly. Cathcart, Merz, and Ryberg[3] reported that cell suspensions of *Staphylococcus aureus* inoculated into the "thickening mix" of custard (cream filling) were destroyed by bringing the product to the boil. Internal temperatures of the cream fillings were not reported by these

* Presented before the Food and Nutrition Section of the American Public Health Association at the Seventy-Fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

Based on portions of a thesis presented by Dorothy L. Hussemann in September, 1946, to the Graduate School of the University of Illinois in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Bacteriology.

authors, but were apparently assumed by them to be at or near the boiling point of water.

The rebaking procedures for cream filled pastries suggested by Stritar, Dack, and Jungewaelter[4] to insure greater safety to the consumer necessarily required investigation of rate of heat penetration into such products. They recommended the routine use of ovens heated from 190.6°C. to 218.3°C. for 30 minutes. Cells of staphylococci inoculated into the cream filling were found to be destroyed by such treatment. Maximum temperatures for the cream filling within the pastry of 75°C. for 5 minutes and of 76.7°C. for 6 to 8 minutes were recorded for uncovered and covered pans, respectively. Gilcreas and Coleman[5] reported somewhat similar data. Using inoculated custard (cream filling), the latter workers observed that no viable staphylococci cells were demonstrable following rebaking of eclairs. They determined that by such a procedure a maximum temperature of 71°C. was found to exist in the cream filling for a period of more than 5 minutes.

The investigations of Hucker and Haynes,[6] Nunheimer and Fabian,[7] and of Ryberg and Cathcart,[8] which indicate that temperature necessary to free a mixture of ingredients of staphylococci is related to the composition thereof, cannot be ignored.

MATERIALS AND METHODS

A. *Preparation and bacteriological examination of cream filling*:

The formula and procedures used for the cream filling were as follows:

Flour	80 gm.
Sugar	200 gm.
Salt	6 gm.
Milk, reconstituted evaporated	980 ml.
Eggs	200 gm.
Vanilla	6 ml

The sugar, flour, and salt were mixed and then made into a paste with 100 ml. of the milk. The remainder of the milk was placed in the top of a 1½ quart double boiler, and a copper-constantin thermocouple attached to an automatically recording six-point recorder* was inserted into it. The milk was heated until it foamed and then it was poured with stirring into the sugar, flour, salt, and cold milk mixture. During this time of mixing and for all others, measurement of temperature was discontinued and was reinitiated when the mixture was returned to the stove for further cooking. The milk containing the thickening mixture was heated in the upper part of the double boiler over 1 liter of boiling water for 8 minutes, by which time it had attained maximum thickness. It was then covered with a tightly fitting lid, perforated in such manner that a thermocouple was permitted to pass through. Heating was continued for 15 minutes, the mixture being uncovered and stirred at 5 minute intervals. The hot mixture was then added to the eggs with stirring. The water in the lower part of the double boiler was adjusted to 90°C., and the cream filling was heated in the upper part of the double boiler for another 5 minutes. At the conclusion of this cooking, the whole was beaten for 30 seconds with the electric mixer† at medium speed in order to assure uniformity and to hasten cooling. The cream filling was then poured into two cream soup plates and placed in a refrigerator which registered 4°C. for 30 minutes. Hydrogen ion determinations were made on the filling using a potentiometer.‡ Seventy gm. of the cream filling were weighed into each of eight previously prepared cream puff pastries.

Adequate supplies of all staples and

* Micromax, Leeds and Northrup, Philadelphia, Pa.

† Powermaster, Sears Roebuck and Company, Chicago, Ill.

‡ Leeds and Northrup, Philadelphia, Pa.

milk for use throughout these experiments were obtained before beginning work. The eggs, produced by the university flock, were purchased as needed, two dozen at a time. The laboratory worker washed her hands in mercuric chloride solution, then in soap and water, and dried them on a sterile towel previous to beginning cookery each day. Frequent washing of the hands in soap and water was practised throughout the ensuing time of work. A face mask, covering nose and mouth was worn during all manipulative procedures.

The cream puff pastries which were prepared in the laboratory were handled with wax paper. The tops of the pastries were cut off, the cream filling was inserted, and the tops replaced. The filled cream puffs were wrapped in a wax paper and stored in four different ways: two were quick-frozen immediately, two were placed in a household refrigerator, two were held at room temperature, and two were placed in a 37°C. incubator. At the end of 24 hours and again at the end of 48 hours, a small amount of filling and a small amount of pastry from one cream puff representing each method of holding were each placed in 10 ml. of sterile water and shaken thoroughly. Phenol red mannitol agar and bromthymol blue lactose agar pour-plates were inoculated with these suspensions. Eight baking trials were made, and from these 256 platings.

Any colonies appearing on the plates were transferred to nutrient agar slants, incubated at 37°C. and the growth thus obtained was studied microscopically, using the Gram stain.

B. *Thermal death time determinations:*

1. Preparation of sterile cream fillings —A cream filling was prepared by the method described above except for the following alterations in ingredients and procedures: (1) All equipment to be used including bowls, spoons, knives, double boiler and lids were sterilized in the autoclave. Ingredients were weighed into these sterile containers and were immediately covered with the paper which had been in place during sterilization. Mixing in so far as possible was done under these papers or sterile lids. (2) Specially treated flour and sugar * were obtained. In our laboratory these ingredients were sterile on all test platings on tryptone glucose extract agar.† (3) No thermocouple recordings were made during the heating. (4) After thickening following the addition of the flour and sugar to the milk, the mixture in the upper part of the double boiler was placed over the direct flame and brought to a vigorous rolling boil for 5 minutes and then returned to over-water cooking, and allowed to cool sufficiently so that it could be added to the eggs. (5) At the conclusion of cookery the filling was poured immediately into four weighed, sterile metal cups, which were attachable to an electric blender. Approximately the same quantity of filling was placed in each cup. The cup was opened as briefly as possible and as soon as the filling was placed therein, and the cover returned, the whole was placed in a refrigerator. The pH value of each batch of cream filling prepared was determined electrically.

2. Preparation of the inoculum—Twenty-four hour growth of *Staphylococcus aureus* Strain C12069 (Dolman) from 2 large tryptose agar slants ‡ was suspended in 10 ml. of sterile saline. The saline suspension from both slants was poured into a 200 ml. Erlenmeyer flask which contained 40 ml. of sterile saline and glass beads, and was shaken. The suspension was diluted until, using matched tubes, a reading of 40 per cent light transference was obtained on a photoelectric turbidimeter, using a

* The Griffith Company, Chicago, Ill.

† *The Difco Manual*, Difco Laboratories, 7th Edition, p. 23

‡ *Ibid*, p. 90

yellow-green filter, number 530.* Preliminary tests had shown that such a reading was approximately equivalent to 100,000,000 cells per ml. of suspension.

3. Preparation of thermal death time tubes, heating and plating—Aliquots of the cream filling for use as control experiments were withdrawn from the cans and manipulated in the same manner as the inoculated samples.

A sufficient quantity of the suspension of cells of *Staphylococcus aureus* Strain C12069 described above was added to the cream filling remaining in the metal cup to give a calculated inoculum of 100,000,000 cells per gm. The inoculum was incorporated by beating for 3 minutes with the electric blender.† Platings of 1 ml. of this inoculated filling in 1:1,000,000 dilution were made on tryptone glucose extract agar. The average of the plate counts for all such platings made (47) served as a measure of the number of cells in the unheated filling.

One ml. portions of the inoculated cream filling were put into thermal death time tubes of the type described by Sognefest and Benjamin,[9] using a standard sterile 10 ml. syringe and a 12 gauge, 5 in. needle. The tubes upon receiving the 1 ml. of inoculated filling were covered with cotton until sealed. Triplicate tubes were used at all temperatures and at all time intervals in each experiment. In all cases at least 3 complete experiments, and thus 9 tubes, were used. This is essentially the technique first proposed by Bigelow and Esty.[10]

After sealing, the tubes containing the inoculated filling were heated in a DeKhotinsky constant temperature oil bath ‡ for varying lengths of time. The temperature of the oil bath was controlled by means of a thermo-regulator, and the heat was kept uniformly distributed throughout the bath by an electrically operated stirring device. At 55°C. the time intervals of heating were 4, 5, 6, 7, 8, 10, 12, and 30 minutes; at 65 and 75°C. the time intervals were the same except that the 30 minute observation was omitted. At 85°C. 2, 3, 4, 5, and 6 minutes were the intervals employed.

Upon the completion of heating, the tubes were iced instantaneously. Removing the filling from the tubes was accomplished by adding 1 ml. of sterile saline to the filling in the tube and mixing with a sterile, cotton-plugged, capillary pipette. After a uniform mixture was obtained, a measured quantity was placed in a test tube containing a sterile saline dilution blank.

It was necessary for the final dilutions of the inoculated filling to vary with the time and degree of heating in order to secure plates which were suitable for counting. The dilutions which were found to be applicable in this series of experiments are indicated below.

55°C.—all time intervals—1:400,000
66°C.—all time intervals—1:2,000
75°C.—all time intervals—1:200
85°C.—all time intervals—1:200

In all cases 0.1 ml. of the dilution shown above was plated. The platings were made on tryptone glucose extract agar. The counts were recorded and the per cent of survivors calculated.

As a basis for comparison the thermal death time temperature relationships of the same strain of *Staphylococcus aureus* in a pH 7.0 phosphate buffer was determined in a similar manner. One ml. portions of suspension of viable staphylococci cells standardized as to approximate number by use of the photo-electric turbidimeter placed in thermal death time tubes. These tubes were sealed and heated in the constant temperature oil bath. The temperatures and times used

* Photovolt Corporation, New York, N. Y.
† Stevens Electrical Company, Racine, Wis.
‡ Central Scientific Company, Chicago, Ill.

TABLE 1

Showing the Percentage of Surviving Cells of Staphylococcus aureus Strain C12069 (Dolman) When Heated in Cream Filling for Varying Times and Temperatures (Inoculum Approximately 113,000,000 Cells per Milliliter)

Time in Minutes	Organisms Surviving 55° C.† Per cent	Organisms Surviving 65° C.‡ Per cent	Organisms Surviving 75° C.‡ Per cent	Organisms Surviving 85° C.‡ Per cent
2	.... *	....	...	0.01
3	....	....	...	0.0
4	132.6	0.22	0.0	0.0
5	263.5	0.22	0.0	0.0
6	120.6	0.05	0.0	0.0
7	159.9	0.13	0.0	...
8	17.3	0.0	0.0	...
10	34.3	0.0	0.0	...
12	26.0	0.0	0.0	...
30	8.2	....	...	...

* No tests.

† Values Represent Average of 18 Trials.

‡ Values Represent Average of 9 Trials.

in this series were: 4, 5, 6, 7, 8, 10, 12, and 30 minutes at 45 and 55°C. and 4, 5, 6, 7, 8, 10, and 12 minutes at 65 and 75°C., respectively. After heating, dilutions were made as follows:

45°C.—all time intervals—1:10,000
55°C.—all time intervals—1:1,000
65°C.—all time intervals—1:100
75°C.—all time intervals—1:100

One-tenth ml. of the final dilution as indicated was plated on tryptone glucose extract agar, and counts were made and recorded. These counts were compared with the average number of cells known in approximation to have been present in the unheated phosphate buffer suspension, by counts of 46 platings. Percentages of survivors were calculated.

The time which was required for the temperature of the contents of the tube to reach the temperature of the oil bath (lag time) was determined for both the cream filling and the phosphate buffer, using a specially constructed copper and constantin thermocouple * and a potentiometer indicator.† Time in seconds for this lag was noted using a stop watch and was recorded.

RESULTS AND DISCUSSION

In Table 1 are presented the results obtained in the thermal death time determination for *Staphylococcus aureus* Strain C12069 (Dolman) in cream filling. It can be seen that small numbers of this organism (8.2 per cent) seemed to survive heating for more than 30 minutes at 55°C. Furthermore, with the cream filling as the suspending medium, this strain of *Staphylococcus aureus* apparently was killed by 8 minutes of heating at 65°C., less than 4 minutes of heating at 75°C., and less than 3 minutes of heating at 85°C. The average pH value for the cream filling was 6.48. A consideration of the time lag in the penetration of the heat into the cream filling in the tube must be made, however, before these values for time-temperature relationships in destruction of the organism can be accepted as absolute. The lag times in heating at 55, 65, 75, and 85°C. were respectively: 2 minutes 10.0 seconds; 2 minutes 22.1 seconds; 2 minutes 28.3 seconds; and 2 minutes 31.0 seconds. At all temperatures there was a substantial length of time before the cream filling within the

* Furnished through the courtesy of Dr. J. M. Jackson, American Can Company, Maywood, Ill.

† Number 522169, Leeds and Northrup, Philadelphia, Pa.

tube reached the temperature being tested for its lethal effect upon the cells. It is probable, therefore, that viable cells were destroyed in somewhat less time than is indicated for each temperature in Table 1.

For all of the control experiments using sterile cream filling and the techniques described, the results were negative. No colonies appeared on the tryptone dextrose extract agar plates even though the tubes of cream filling were heated for only the shortest time interval under test.

The results obtained when a phosphate buffer with a pH value of 7, was used as a suspending medium for viable cells of *Staphylococcus aureus* Strain C12069 (Dolman) are shown in Table 2. Sterilization was apparently effected at a lower temperature under this condition. Growth on tryptone dextrose agar later was obtained from the suspension of cells heated 30 minutes at 45°C. This was also true to a slight degree for cells heated up to 7 minutes at 55°C. However, beyond that point and at all time intervals tested at 65°C. and 75°C., the viable cells apparently were killed. Uninoculated phosphate buffer, manipulated in the same manner as the cell suspensions appeared to be sterile. As might have been expected, lag in time of heating the tube contents to the temperature of the oil bath was less for phosphate buffer than for the cream filling. These lag times were determined to be 44.2 seconds, 54.6 seconds, 1 minute 37.2 seconds, and 1 minute 51.8 seconds, at 45°, 55°, 65°, and 75°C., respectively.

It would appear that during the preparation of the filling, the milk, flour, and sugar were maintained at a temperature of above 65°C. for much longer than the 8 minutes apparently necessary for sterilization of staphylococci. Following the addition of the eggs, the temperature appeared to remain above 75°C. for a sufficient length of time to free the mixture from staphylococci.

These findings were further verified when cream fillings were plated, which were carefully prepared from ingredients purchased in ordinary retail markets, placed in cream puff pastries, and held under varying conditions. Growth appeared on 92 of 256 plates but staphylococci were never detected. For the most part the organisms recovered appeared to be large spore-bearing rods and occasionally *Sarcina*. Staphylococci could have been overgrown on many plates in this series but on the whole, with the temperatures known to have been applied during cookery and a knowledge of the thermal death relationships of the organism in cream filling, it appeared that this filling was sterile for staphylococci when cooking was completed.

In the thermal death time trials at 55°C. the increase of cells above 100

TABLE 2

Showing the Percentage of Surviving Cells of Staphylococcus aureus Strain C12069 (Dolman) When Heated in Phosphate Buffer, pH 7, for Varying Times and Temperatures (Inoculum Approximately 96,000,000 Cells per Milliliter)

Time in Minutes	*Organisms Surviving 45° C.* Per cent*	*Organisms Surviving 55° C.* Per cent*	*Organisms Surviving 65° C.* Per cent*	*Organisms Surviving 75° C.* Per cent*
4	2.6	2.2	0.0	0.0
5	2.8	0.8	0.0	0.0
6	2.7	0.55	0.0	0.0
7	2.1	0.2	0.0	0.0
8	1.7	0.0	0.0	0.0
10	1.7	0.0	0.0	0.0
12	4.4	0.0	0.0	0.0
30	3.3	0.0	...	...

* Values Represent Average of 9 Trials.

per cent of the inoculum may require comment. It seemed possible that the very length of the manipulation may have been explanatory. However, a series of experiments in which the cream filling was held in ice from the point of inoculation and except for the heating period to the moment of plating, seemed not to eliminate the phenomenon. It may have been that certain of the procedures used succeeded in breaking up cell clumps. At the longer heating periods, cell metabolism may have been driven to a higher pitch and thus cell multiplication occurred more rapidly.

The method used here for mixing and cooking cream filling differed in some details from the method described by Stritar, Dack, and Jungewaelter [4] and Cathcart, Merz, and Ryberg.[3] The variance occurs chiefly in degree of heat applied. At no point in the techniques here reported was the mixture boiled. This method is in harmony with the recommendation of many authoritative quantity cookery recipe books and is based upon the usual principles for proper starch and egg cookery.

The thermal death temperature-time relationships determined here may perhaps be applicable to the feasibility of rebaking cream filled mixtures as a public health prophylactic measure. When the temperatures attained in the rebaking procedures developed by Stritar, Dack, and Jungewaelter [4] were compared with critical thermal death times and temperatures as observed here, it appeared that their method allowed for reaching the minimum or in excess of the minimum for destruction of staphylococci, when the cream puffs were maintained in an oven of 190.6°C. for 30 minutes. The technique for rebaking of cream filled mixtures as described by Gilcreas and Coleman [5] allowed little, if any, margin of safety in time and temperature necessary to destroy organisms, when considered in light of the results presented here. Apparently there is some merit in the rebaking procedures but it would appear that bakers must be cautioned to control the conditions carefully under which the work is done, or a false sense of security may result.

SUMMARY AND CONCLUSION

Using the multiple tube method, an attempt was made to establish thermal death time-temperature relationships for staphylococci in cream filling and to correlate such findings with the range and duration of temperatures attained in accepted cooking procedures for cream filling. One strain of *Staphylococcus aureus* was used as the test organism. Thermal death time determinations for the same organisms were also made at a range of temperatures, using a pH 7 phosphate buffer solution for the suspending medium.

In the range of temperatures studied, *Staphylococcus aureus* Strain C12069 (Dolman) was found apparently to survive for 30 minutes at 55°C. and to be destroyed in less than 3 minutes of heating at 85°C. In phosphate buffer solution, pH 7, the organism survived somewhat less stringent heat treatment. It appeared that at the conclusion of such a cooking procedure, cream filling was free from viable staphylococcus.

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Haven Emerson to Deliver Cutter Lecture

The Harvard School of Public Health announces that Dr. Haven Emerson, Emeritus Professor of Public Health Practice, Columbia University School of Public Health, New York, will deliver the Cutter Lecture on Preventive Medicine on November 24, 1947, at 5 p.m. in Amphitheatre D of the Harvard Medical School. Dr. Emerson has chosen as his subject, "Whither the Pegasus of Public Health?" The Cutter Lectures on Preventive Medicine have been held since 1912, according to the terms of the will of Dr. John Clarence Cutter, of the class of 1877, which directed that they should be "free to the medical profession and to the press." In addition, medical and public health students and others interested are cordially invited to attend.

Canada Sees New Horizons for Health Education*

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Director of Information Services, Department of National Health and Welfare, Ottawa, Canada

IN order fully to appreciate the scope and progress of health education work north of the 49th parallel, one must first have a quick glimpse of the geography, the economy, and the governmental set-up of Canada.

Here is a vast country, with lines of communication covering more than three million square miles, whose population of twelve and a half million is concentrated in a "strip" along the southern border. Here is a nation which in a quarter century has twice marched to war and in eleven years of all-out effort contributed men, money, machines. Here is a nation now risen from comparative obscurity in world affairs to a secondary power, third only to the United States and Great Britain as a trading nation.

With a central federal authority and nine autonomous provincial governments, Canada has its problems of administration. There are the "have" and "have-not" areas. There are the two official languages.

But certainly in the twin fields of health and welfare there is very close federal-provincial coöperation. It has developed over the years, despite the fact that the British North America Act of 1867, Canada's Constitution, only very sketchily laid down the responsibilities of governments at the two levels.

The Dominion had certain statutory obligations — among them, administration of the Food and Drugs Act, the Quarantine Act, The Opium and Narcotic Drugs Act. Responsibilities were divided among several departments, but in the broad field of public health education comparatively little was accomplished on the federal level until 1944 when Parliament passed "An Act To Establish a Department of National Health and Welfare." It was to take over the health function of the Department of Pensions and National Health.

One of the most important provisions of the new act was this: "Coöperation with provincial authorities with a view to the coördination of efforts made or proposed for preserving and improving the public health and providing for the social security and welfare of the people of Canada."

It was early seen that one of the most effective measures of coöperation would be that of health education. The provinces, active in varying degrees in such fields as child and maternal health, nutrition, mental health, blindness control, industrial health, dental health, venereal disease control, welcomed the emergence of such new divisions at the federal level. Busy with the organization of local health units and other administrative detail, provincial authorities were pleased to take advantage of consultative services and health education materials made available to them free of charge.

* Presented before the Public Health Education Section of the American Public Health Association at the Seventy-fifth Annual Meeting in Atlantic City, N. J., October 10, 1947.

In November, 1946, the first Dominion-Provincial Health Education Conference was held. Such a conference had been recommended by the Dominion Council of Health, which has often been referred to, somewhat erroneously, as "Canada's Health Parliament." The Council is composed of the chief executive officer of the provincial department or Board of Health of each province, representatives from the fields of science, agriculture, labor, and English and French-speaking women's organizations. Twice yearly for three days the Council meets in Ottawa under the chairmanship of the Deputy Minister of National Health and, while it is not empowered to make regulations, its recommendations to the Minister have resulted in many health improvement measures of far-reaching significance.

This year health educators and others in the field will be called together again as guests of the Department of National Health and Welfare. Under review will be the first full year of coöperative effort toward improvement in quality and output of health education materials at all levels. Continuing to provide leadership in the production of books and pamphlets, radio material, posters, displays and films, the federal department has also acted as a clearing house for ideas and materials produced by provincial authorities, thus insuring that all parts of the country are kept acquainted with progress elsewhere.

Health educators of the government services and those with voluntary agencies are unanimous in their opinion regarding the teaching value of the motion picture. The Department of National Health and Welfare has during the last year or two devoted a sizable slice of its education and information budget to this medium. Not only have we produced 17 films and filmstrips of varying length, with 13 more in production or in the scripting stage, but we have built up in conjunction with the National Film Board, four one-print film libraries. There are a Public Health Library with 150 titles, a Biological and Medical Library for professional use with a like number of prints, a Physical Fitness and Recreation Film Library, and a Welfare Library, the latter newly organized.

All the best material from Canada, the United States, Britain, and many other countries is screened and evaluated by professional and lay committees, and prints are made available to government departments, organizations, or individuals on a low-cost rental basis.

The National Film Board, a government agency, is responsible for all original productions, and I should like to call attention to the fact that several of our Canadian films are being shown daily in Mr. Stowell's "little theatre."

New productions include the following "Mother and Her Child," "Let's Look at Water," "Your Morning Milk," "Know Your Baby," "Condition Improved" (occupational therapy); "Rural Health," "Small Fry" (pointing up the contribution of Family Allowances to the welfare of Canada's children); "Sixteen to Twenty-Six" and "Very Dangerous" (adapted from R.C.A.F. venereal disease films for female and male audiences respectively); "What's on your Mind" (mental health); "Stanley Takes a Trip" (a color cartoon film on nutrition), and "The Feeling of Rejection."

The last mentioned is the first in a proposed series entitled "Mental Mechanisms" designed to illustrate the development of personality factors which often lead to emotional difficulties and physical distress. It is, we believe, a valuable tool in group psycho-therapy and is useful for parent-teacher education and in the instruction of social workers, nurses, and medical students.

Then, scheduled for release is a film on "Hostility," the second in the

Mental Mechanisms series; two short films on Rural Sanitation and Rat Control; a two-reeler on Immunization, stressing parental and community responsibility; a color film on Dental Health; a color filmstrip and a black-and-white film for professional use on Narcotic Drugs; a brief film called "Fit for Tomorrow" on community recreation programs; a film on Restaurant Sanitation; a series of six cartoon filmstrips under the title "Why We Eat" and another filmstrip, called "Internal Triangle" showing the adaption of Canada's Food Rules to meal planning.

The first-named film—"Mother and Her Child"—which is in color and synchronized sound and 50 minutes long, is based on the book *The Canadian Mother and Child,* written by Dr. Ernest Couture, director of our Division of Child and Maternal Health. More than 800,000 copies of the 232 page book have been distributed free in the last few years and we are now going into the seventh reprint. In addition to the film we have produced two complementary filmstrips on prenatal and postnatal care—"Nine to Get Ready" and "Introducing Baby." Films are produced in both English and French.

In printed materials the aim always is toward attractive format, bright design, interest, readability. We believe the health story can be told effectively in everyday language. Scientific gobbeldy-gook is out. Old publications are constantly under revision and new ones planned.

The success of this policy may be indicated by the fact that last year we published and distributed free to the provinces and to organizations and individuals more than two million pieces of printed material. New Zealand has recently requested permission to reprint one of our booklets. Tasmania is interested in another.

One publishing project planned is a series of three companion pieces to *The Canadian Mother and Child.* They will cover the growth and development of the child from one to six, the school-age child and the adolescent. Another afoot is a series of four booklets under the general title "Posture's Important."

All publications, including posters, are produced in English and French editions. This includes three monthly periodicals—*Canadian Nutrition Notes, Industrial Health Bulletin* and *Canada's Health and Welfare.* The last is the departmental magazine; with a circulation of 85,000, it serves as an informational liasison link between all branches of government down to the municipal level and voluntary organizations.

As an example, the magazine is now carrying a series of illustrated supplements on specific health subjects. The first of these was on cancer and 450,000 copies were made available to the Canadian Cancer Society for distribution.

The federal department, indeed, cooperates closely with all national voluntary health and welfare organizations. Newsclips and exhibits have been provided free to the Health League of Canada, and the film on immunization mentioned above, is being made to tie in with the League's national immunization campaign. The Canadian Welfare Council formerly produced quantities of literature on child care and training for sale near cost. These publications have now been taken over by the federal department, being revised and reissued free through Information Services Division.

More recent additions to the Health Branch of the department—new Divisions of Hospital Design, Civil Aviation Medicine, Health Insurance Studies, Civil Service Health, Epidemiology—all pose special problems and bring new opportunities in the field of health education. For the first named, as an example, we have published a portfolio of plans of small hospitals and health

units which, like all our literature, goes free to provincial departments and municipalities.

There is a challenge, too, in the work of the Welfare Branch of the department which is responsible for the Old Age Pensions Act, the Physical Fitness Act, and administration of Family Allowances.

Canada is the only country of the Western Hemisphere with a system of family allowances. Every child in Canada—and there are now 3,704,622 registered—receives a monthly payment, ranging from $5 to $8, from the government. It is paid to the mothers from the time the child is born to 16 years of age. On an average month 22 million dollars goes out by cheque. In the two years and three months since Family Allowances came into being nearly 550 millions have been distributed, mostly among the wage earners in the lower brackets.

We know that Family Allowances have accomplished several things already. There has been an improvement in the dietary habits of the nation. Notably there has been an increase in the consumption of milk and milk products as well as fruits. There has been an improvement in school attendance, because that is one of the conditions of payment—and many children are now being properly clothed and equipped to go to school. The psychological effects are incalculable.

In two years there has yet to be a conviction for misuse of these allowances, but there is much to be done in an educational way to insure the *best* use. It is a task of the Information Services Division to help tell thousands of mothers about better money management.

Canada's Indians and Eskimos get Family Allowances, too. Some of them in remote areas are paid "in kind"—that is, receive the value of their cheques in goods from local trading posts.

Much is being done, more planned, to improve the health of Indians and Eskimos. Cooking courses and homemakers' classes are carried on. We have produced colorful calendars with simple health slogans to go out with Family Allowance cheques. Films are used extensively for teaching, and we are now producing literature in Cree and Eskimo syllabics as well as English and French.

I earlier mentioned radio as a medium. The Canadian Broadcasting Corporation has done a notable job in the health education field. Not only do we maintain a close liaison, but the CBC producers also work with other government departments and voluntary agencies in telling the story to the public. For the CBC and private radio stations in Canada we produce a regular service of broadcast material.

The press, as always, coöperates splendidly, and it is worthy of mention that more than one-half of the weekly newspapers in Canada, both English and French, publish a weekly column produced and issued by my division. In times of epidemic or emergency the daily newspapers and the radio stations can always be relied upon to flash the necessary warnings and instructions to the public.

I regret that there is not space to discuss in detail the health education programs in the provinces, five of which —British Columbia, Alberta, Saskatchewan, Manitoba and Quebec—have full-time health education divisions. May I leave with you, just a few highlights:

British Columbia points with pride to the fact that she leads all the western provinces in percentage of population covered by full-time health units as well as in number of health units. More than 65 per cent of the population is served by this modern type of health program. In addition, public health nursing service is available to nearly 90 per cent of the population. A consultant in health education, Miss Kay McNevin,

was added to the staff early last year. The Health Department and the Department of Education are planning and conducting experiments in venereal disease education in high schools.

Province of Alberta—One of the most notable experiments in the province was carried out in the Lamont Health District. As a publicity and teaching enterprise for the benefit of the housewives of the district, a six week camp for undernourished boys was conducted. The unusual nature of the camp, together with the general improvement in the health of the thirty boys who attended, aroused much interest, and the community was ready for and receptive to further nutrition education. Projects in community nutrition were expanded. These included the distribution of vitamins to preschool and school children, location and publicizing of local food sources with information on the best preparation of such foods, dietary surveys and general education implemented by lay participation, and nutrition education in the schools.

In *Saskatchewan* the Division of Health Education, headed by Christian Smith, has hitched its educational program to the family and it has consistently maintained a psychiatric approach to delinquency, venereal disease, alcoholism, and other subjects. Relating this to the changing school curriculum, the division has persuaded the Department of Education to introduce family life education in the secondary schools, starting in Grade 10 and developing this as a compulsory subject for both sexes in Grades 11 and 12 (senior matriculation). The Department of Education has also been persuaded to include human reproduction in physiology (starting at Grade 10) and the venereal diseases with communicable diseases in Grade 10 study.

In the realm of publicity and public relations, the division in two months "sold" the compulsory hospital services insurance plan to the people of the province; helped to persuade 35,000 residents of a rural area to accept full-time public health services on a regional basis; conducted a successful recruiting campaign among high school graduates, university students, and teachers for mental hospital staffs.

Manitoba—Springboard of activities for the Division of Health and Welfare Education in Manitoba is the Health Services Act of 1945. Its four parts include the organization of health units, diagnostic services, prepaid medical care and hospitals. Various parts of the province are concerned with one or more phases of the plan and it is the responsibility of the Director, Miss Margaret Nix, once the details of the plan are complete, to go into the area and, with every educational and publicity means available, prepare the community to pass the necessary by-laws. In every case the votes have been favorable. Twelve health units which cover 45 per cent of the population have been organized, one diagnostic unit, four general hospitals, and twelve medical nursing units.

In *Quebec*, the Director of Health Education is a medical doctor, Jules Gilbert, who is also Assistant Director of the School of Hygiene, University of Montreal. The outstanding feature of his program has been the building up of a staff of public health educators of whom he now has 13 working in as many county health units with the adult population. These health educators are nurses with a pedagogical background and experience who have received additional training at United States universities. New health educators will be trained at the Montreal University School of Hygiene. In the field of school health, Quebec has sent 11 normal school teachers and school inspectors to take a full year's training in school health education at universities in the United States. Recently the

school health curriculum for elementary grades was revised, and to give impetus to this program a degree course in health education for teachers has this year been introduced at the Montreal University School of Hygiene with an initial enrollment of 40.

In *Ontario*, most populous of Canadian provinces, health education work is directed and correlated by Dr. D. S. Puffer, assistant to the chief medical officer of health. A notable recent development was an amendment to the Public Health Act providing for free medical examination of expectant mothers. Feeling that it was necessary not only to inform the public fully but to do an educational job on the doctors too, Dr. Puffer's office had 250,000 letters prepared and circulated outlining what it was hoped to accomplish by the new legislation.

The job was thorough. The regulation is applicable only within the boundaries of Ontario, but the health department finds doctors sending in reports on expectant mothers resident in Manitoba, Quebec, and even the State of New York!

The Maritime Provinces of *New Brunswick*, *Nova Scotia*, and *Prince Edward Island* have taken notable strides since war's end setting up new public health services. The tools of health education available from the federal department are particularly useful to those provinces whose funds for development of their own materials are at a premium.

And so it is that the coöperative effort in Canada goes on. There have been many evidences of improvement in the health of the nation over the years. Further improvement is dependent largely upon informed and enlightened public opinion. Health education has many sides to it. It is a long-term investment. Together with other departments of government, with professional and lay groups, and with voluntary organizations, the Department of National Health and Welfare is at all times working to evolve practices which will raise the level of health and welfare of the whole Canadian people.

Administrative and Research Uses of Routine Analyses of Hospital Statistics*

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IN recent years, there has been a trend toward enlargement of the scope of statistical services in state and local health departments. To the traditional registration functions of the vital statistics office, more analytical functions have been added, sometimes directly within the vital statistics office; sometimes in some other division of the health department but still in close coöperation with the registration office.

This growth is the result of the recognition of the need for more factual data to aid in defining the nature and scope of the problems confronting the health department, to serve as the basis of intelligent planning for their solution and, finally, to furnish a means of evaluating the effectiveness of the attack on these problems.

In many hospitals, at the present time, there is a similar awareness of the need for quantitative analyses, both of problems within the hospital and of problems having to do with the relationship of the hospital to the community. In many instances, this awareness has crystallized in the development of a statistical unit within the hospital not unlike that which has complemented the work of the registration office of the health department.

It is proposed here to present a few of the administrative and research uses of analyses of various types of hospital data. While the examples used reflect the experience of the Vanderbilt University Hospital, similar analyses are being made in many other hospitals. The examples have been chosen to emphasize a point; namely, that there is present, in the material accumulated in the hospital histories in the ordinary course of events, a wealth of information which, if tabulated and analyzed routinely, can point the way for more efficient hospital administration, indicate special problems needing study, and provide background data which may be used to great advantage in research problems.

ANALYSES OF DATA PERTAINING TO THE HOSPITAL AS A WHOLE

Every hospital history contains such basic facts as history number of the patient, his age, race, residence, and, in addition, certain data regarding his hospital experience such as length of stay, the service from which he was discharged, his status on discharge, and the final diagnosis. The general pay status may also be included, such as ward, low cost private, or private patient.

* Presented before the Vital Statistics Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

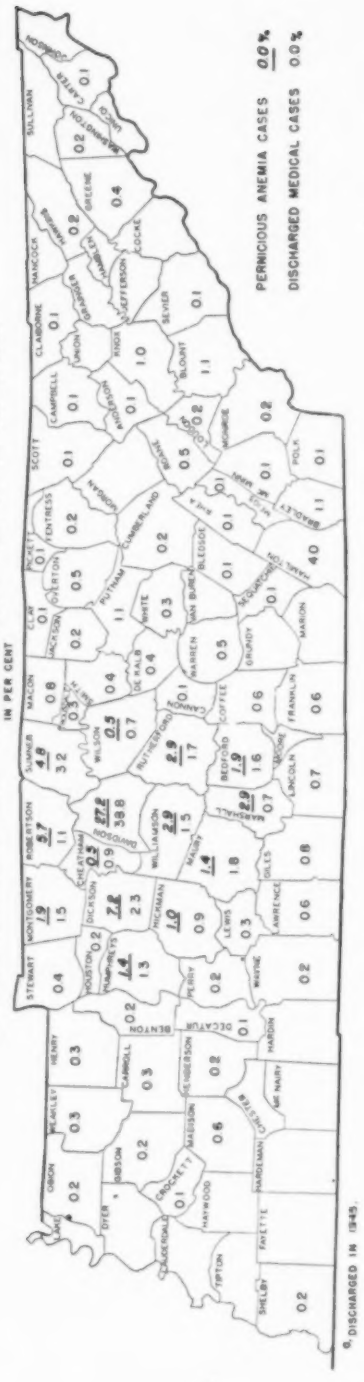


FIGURE 1
DISTRIBUTION BY RESIDENCE OF 1744 PATIENTS DISCHARGED FROM THE MEDICAL SERVICE[a] AND OF 209 PERNICIOUS ANEMIA CASES SEEN IN VANDERBILT HOSPITAL FROM 1925 TO 1945 IN PER CENT

From such information made available in easily tabulated form, as a punch card, a number of interesting administrative questions may be studied. For example, occupancy rates are usually available for the hospital as a whole but, like the crude death rate, the overall occupancy rate sometimes obscures situations revealed more clearly by specific rates. In a private hospital which relies for part of its income on the fees paid by private patients, the hospital administrator finds it useful to know the occupancy rate of the private service and of the ward service. Occupancy rates by department of the hospital are also very interesting. The rate of one department is not always comparable with that of another (e.g. obstetrics vs. medicine), but each department may be compared with itself over a period of time and the effect of changes in staff or of administrative policies on occupancy easily evaluated.

Many uses may be found for tabulations of the place of residence of the patients. In itself, it is desirable to know what area the hospital serves, especially if the hospital needs of the area are to be considered. Such data are also pertinent to any problem involving follow-up of patients, and they often prove of value from a research standpoint. For example, one of the clinicians noticed that the pernicious anemia cases seen in the hospital seemed to come from certain counties. The same observation had been made quite independently by another clinician and they wanted to know if there was any way to study the correctness of their impression quantitatively. It seemed reasonable to assume that if there was no geographic concentration of the cases, the distribution should not differ from that of other medical discharges. The number of pernicious anemia cases seen in a hsopital like Vanderbilt over a period of time is not very great, so that the control series of discharges

would have to be fairly large if significant differences were to be demonstrated. To tabulate a sufficient number by hand would have been a rather laborious job but it was a simple mater to run the routine punch cards for the necessary data.* The results are shown in Figure I.

Study of Figure I confirms the impression of the clinicians. The differences seen in Robertson, Dickson, and Marshall Counties are greater than would be expected from chance alone. Moreover, the fact that the counties are not contiguous and that Davidson County, in which Vanderbilt Hospital is located, has a smaller proportion of cases than would be expected, suggests the hypothesis that the observed data are the result of a selective phenomenon of some kind, possibly related to the concentration of physicians and their ability to diagnose pernicious anemia. Here, then, a simple tabulation from routinely collected data has answered a simple question which might otherwise have gone unanswered or have led to a laborious and expensive research project.

It may also be emphasized that the collection on punch cards of such routinely available data permits the accumulation of large numbers of observations which may serve as reliable controls for many hospital problems which of themselves yield only small study groups.

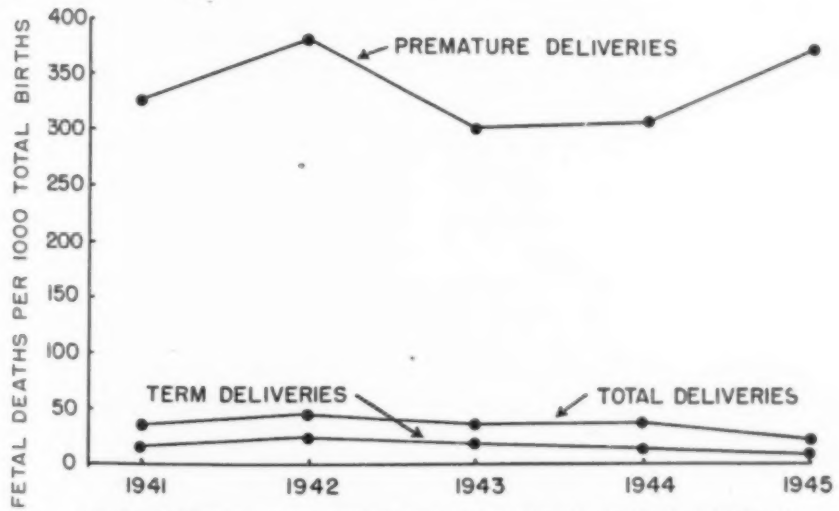
* While the pernicious anemia cases were tabulated for the period 1925–1945, the data on all medical discharges were available on punch cards only for 1945.

ANALYSES OF THE RECORDS OF INDIVIDUAL DEPARTMENTS

In addition to the routine collection and analyses of data contained in the histories of all departments of the hospital, punch cards may be developed

FIGURE II

FETAL MORTALITY[a] IN ALL DELIVERIES[b] AND IN PREMATURE AND TERM DELIVERIES AT VANDERBILT HOSPITAL 1941 - 1945



(a) STILLBIRTHS PLUS IMMEDIATE POSTPARTUM DEATHS NOTED IN MOTHER'S CHART.

(b) EXCLUSIVE OF ABORTIONS.

by each department which will contain much more detailed but still routinely collected information than the card developed for the hospital as a whole. Some of the uses of such cards developed for individual departments follow.

Obstetrics Department:

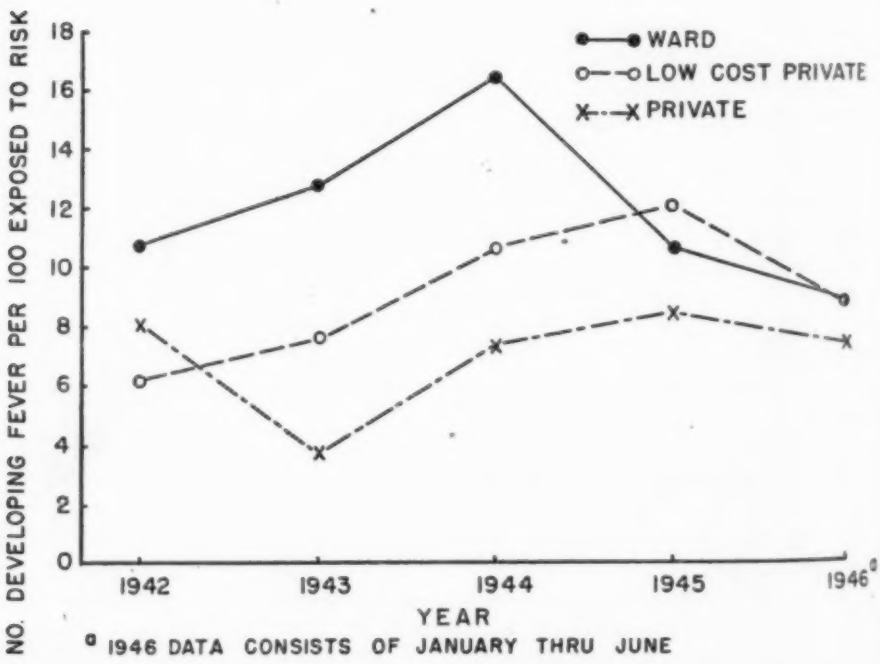
Many administrative uses have been found for the data on the obstetrics punch cards. At the beginning of the war, the accelerated rise in the birth rate resulted in considerable crowding of the obstetrics facilities of the hospital, and the question arose as to how many more bed days would be made available if patients who had no complications were not permitted to remain in the hospital more than one week. It was a simple matter to sort out these cases, make the frequency distribution of length of stay in the hospital, and observe the effect of reducing it to 7 days.

The statistics shown in Figure II on the fetal mortality among infants delivered in Vanderbilt Hospital have been used by the Pediatrics Department to indicate the need for a premature nursery. That they constitute a potent argument is self-evident.

From the research standpoint, the data collected on the same cards have proved of considerable value especially with respect to puerperal fever. In fact, the development of the punch card itself was enlightening for it became quickly apparent that the concepts of puerperal fever held by the obstetrics staff at the time were not very clear. Some included any temperature over 100°F. as puerperal fever; others used 100.4° as the dividing line. Some included the first 24 hours after delivery; others did not.

FIGURE III.

PUERPERAL FEVER RATE BY PAY STATUS
VANDERBILT HOSPITAL 1942 – 1946



Obviously a definition was needed. One was provided and the first tabulation with this definition was made in 1942. The results were surprising and are shown in Figure III.

Ward patients showed a puerperal fever rate in excess of 12 per cent, low cost private patients showed the next highest rate, and private patients had the lowest rate. The rate for ward patients seemed excessive and the rates were rising. Tincture of zephiran sprays were used by the obstetrics department in 1943 with no apparent effect. Vaginal instillations with an aqueous solution of zephiran were tried late in 1944 and early in 1945, still with no apparent effect. Then about April, 1945, the practice of issuing monthly reports on puerperal fever was adopted and the problem was kept constantly in front of the interne staff. They, in turn, posted a list in the nurses' station on the ward of all patients delivered and whether or not they developed puerperal fever. A noticeable spirit of rivalry developed and it came to be considered almost a disgrace for an interne to have one of his patients develop puerperal fever. It may be seen from the graph that the rate for 1945 was lower than for any of the three preceding years, and for the first 6 months of 1946 it has fallen to a new low and is now at the level of the rate for the low cost private patients. Since there had been no changes in obstetric practice during this time except for the exercise of greater caution in handling patients as a result of the constant awareness of the danger of puerperal infection, the drop in the rate appears to be due to the emphasis placed upon the problem.

As the data on puerperal fever were accumulated over several years, another advantage of routine tabulations of such data became apparent. The full study of the problem requires breakdowns along such lines as whether or not an operation was performed, whether there was any relationship to the patient's hemoglobin level and packed cell volume, whether there were differences between primiparae and multiparae, etc. Breakdowns of this sort require a fairly large number of cases if the influence of the various factors is to be evaluated, but if the data are accumulated on punch cards, in time sufficient material becomes available so that they can easily be made. The labor involved in extracting the necessary data from the same number of cases all at one time is usually so great as to prohibit any attempt to make detailed analyses.

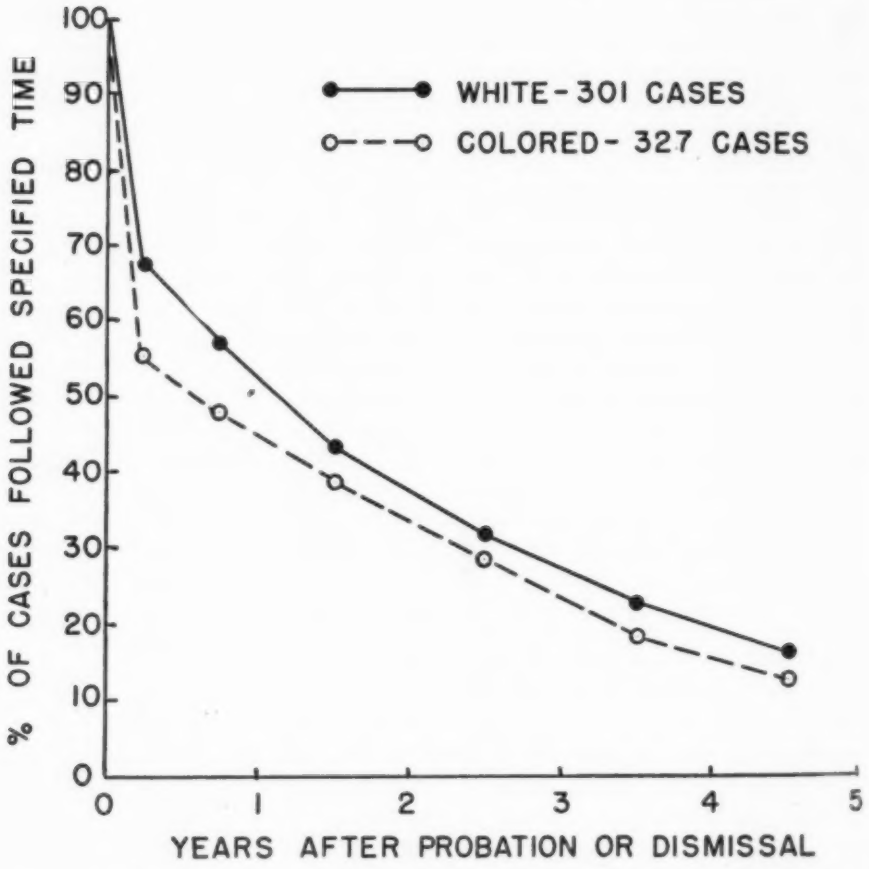
An important off-shoot of these routine analyses of the obstetrics records has been the Vanderbilt Coöperative Study of Maternal and Infant Nutrition. The impetus for this study arose out of discussions in 1944 of the apparent consistency of the differences in the puerperal fever rates among ward, low cost private patients, and private patients. Two possibilities were considered at the time: (1) that the differences might be due to differences in exposure resulting from different numbers of patients in a room in each of the three groups; (2) that the differences might be due to differences in nutritional status of the three classes of patients. Certain detailed tabulations suggested that the first hypothesis was probably not the sole explanation of the differential in the puerperal fever rate. Since the relation of nutrition to various aspects of pregnancy was of interest in itself, a detailed study of the subject was undertaken embracing several departments of the medical school. The relationship of puerperal fever to nutrition is just one aspect of the study, but it was the initial discussion of the results of the routine analyses that was the springboard for the development of this detailed research program.

The Syphilis Clinic:

The punch card for patients coming

FIGURE IV

PERCENT OF SYPHILIS CASES PROBATED PRIOR TO 1941 FOLLOWED IN VANDERBILT HOSPITAL CLINIC FOR SPECIFIED TIME PERIOD

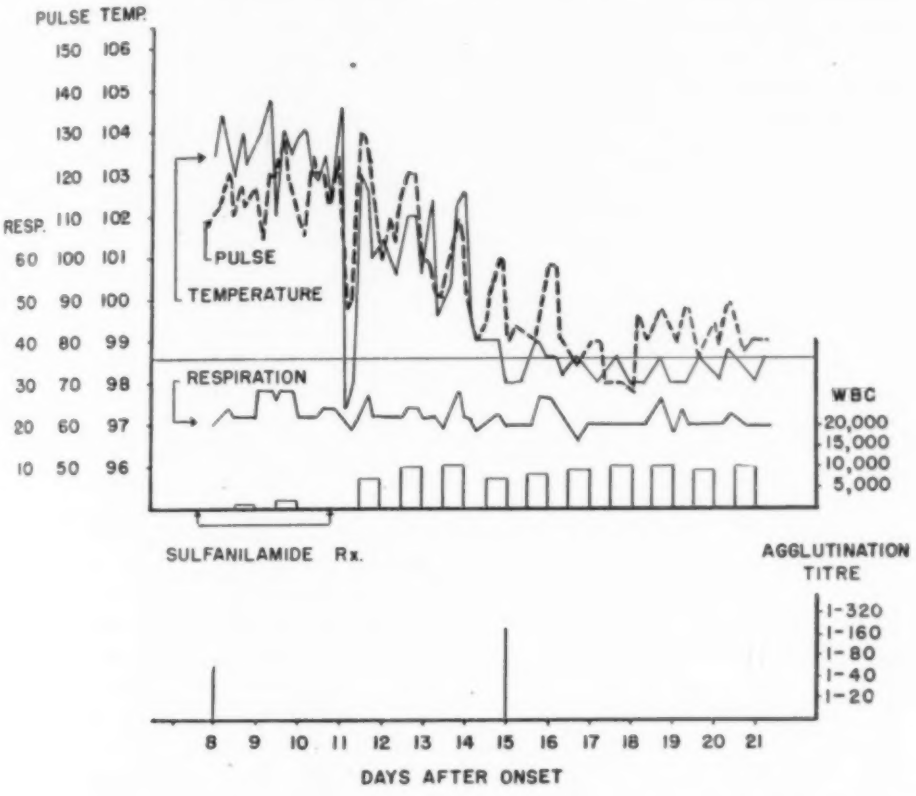


to the syphilis clinic contains, in addition to identifying information, data with respect to diagnosis, treatment, results of serological tests, referral source, status at the time of disposal, and results of follow-up. Many analyses have been made of these data. The material in Figure IV illustrates one such analysis.

Patients who complete their treatment and who are placed on probation are asked to return each 6 month period up to one year and yearly thereafter. It is seen from Figure IV, however, that between 30 and 40 per cent of these patients are lost to observation within 6 months, and considerably less than half are followed for as much as 2 years. Information of this type is of considerable significance with respect to the problem of evaluating the effectiveness of treatment. It is futile to seek such an evaluation in terms of the probability of a relapse within a stated period of time, for the condition of those

FIGURE V

CLINICAL AND LABORATORY FINDINGS IN A CASE OF TULAREMIA – PULMONARY TYPE- SEEN IN VANDERBILT HOSPITAL 1938



who do not return to clinic is unknown and it may very likely differ considerably from the findings on those who do return. The analyses of the data routinely available in the records indicate that more effective means of following patients must be sought if evaluation in terms other than mortality is desired. Similar analyses can be made for any other clinic in which an attempt is made to have patients return for routine examinations.

The Hospital Laboratories:

Hospital laboratory records contain a wealth of data which if routinely analyzed and correlated with other records should do much to aid in the understanding of the pathogenesis of disease and of the clinical significance of the laboratory findings. What is needed for such understanding is a continuity of observation which, unfortunately, is not present in the histories as often as it might be. For example, the director of the bacteriology and serology laboratories at Vanderbilt has made it a practice to bring together data in the histories of certain patients on whom laboratory procedures are requested. Figure V shows some of the data on a case of tularemia in which the laboratory was requested to run an agglutination test. One would like to know here what the course of the agglutination titer was as the clinical symptoms subsided. The

significance of the observed rise in titer cannot be fully appreciated without further observations. Routine bringing together of observations such as those in Figure V should eventually result in improvement in the records.

There is always a great temptation for the hospital staff to place considerable reliance upon a single laboratory report. If the report is positive, further observations may be desirable as shown in the example just cited. If it is negative, its significance may be still more obscure, depending as it does on such things as the way in which the specimen was collected, the accompanying clinical symptoms, and other factors. Attempts to evaluate such factors raise questions as to the information which the laboratory would like to have on the request for examination forms and as to the selection of patients on whom examinations are requested. Many of these questions can be studied by routine tabulation of the information present in the histories, and this in turn should result in the desired continuity of data.

Records of Hospital Employees:

Another source of information which lends itself well to routine analysis is the records of hospital employees. In many ways a hospital is like an industrial plant. It usually carries a sizeable number of people on its payroll, who are exposed to risks peculiar to the hospital environment just as workers in a steel mill are to their particular hazards. Industry has found that it pays in dollars and cents to maintain a health service and to keep records of industrial absenteeism. Relatively few hospitals, however, analyze their records in the same manner, yet all the necessary data are routinely available. The size of the employee population is known and the accounting office usually keeps a record of absences. If the hospital provides a health service for its employees, records are kept as to the causes of illness. All that is needed to develop absenteeism data is organization of the already available records from the statistical point of view. Analyses of such data would not only be of administrative value but, if broken down as to type of hazard, would be of considerable research interest. For example, the absenteeism rate of laboratory workers might be compared with that of the housekeeping staff, just as the rate of workers in one department of a plant is compared with that of another.

GENERAL BENEFITS

Sufficient examples have been given to show that there are innumerable opportunities for analyses of the administrative and research aspects of hospital work. There are, moreover, certain general benefits not related to any particular department, which derive from the development of such analytical procedures in the hospital. As one department follows another in seeking to study the information routinely available in the records, a more critical attitude toward record keeping begins to develop. Records are looked at in terms of their potential statistical uses as well as their use with regard to the individual patient, and in the long run the records tend to improve.

The routine analysis of the records is also productive of much excellent teaching material. In a non-teaching hospital, such material as that cited above on puerperal fever results in an indirect form of staff instruction. In a teaching hospital, material on the prevalence of various conditions among the patients is of value in illustrating points in the courses in obstetrics, pediatrics, medicine, pathology, and others. If courses in medical statistics are given, laboratory problems can easily be constructed from the files of punch cards.

It is often found that analyses of the records point up problems which two or more departments of the hospital

may have in common, and fosters cooperative undertakings. A good example of this is the Coöperative Study of Maternal and Infant Nutrition previously mentioned. Then again, such analyses point the way for integration of preventive medicine practices with procedures in various clinics, as, for example, in indicating the need for x-raying all patients by examining the proportion of patients with a history of contact with tuberculosis.

But the development of routine punch card files is not only of value in correlating the work of one department with that of another; it should also be useful in correlating the records of the various hospitals in the community. As record forms and procedures are standardized, it should be possible to put together data for all the hospitals in the community to give a better idea of the hospital problem of the area. For example, if all the hospitals in Nashville routinely tabulated where their patients came from, it would be possible to obtain a hospitalization rate for the city, inasmuch as only a very small proportion of residents are hospitalized outside the city.

Not only should routine punch card files aid in coördinating the records of the various hospitals in the community, but they should also prove useful in tying together the records of other agencies with those of the hospital. In many communities there is a woeful lack of coördination of the efforts of hospital clinic workers with those of other social agencies and with the public health agencies. The punch card files may present opportunities for identifying groups of individuals who may be found in the records of more than one agency, and this should do much to clarify some of the health problems of the community. In general, then, routine analyses of hospital records may be of benefit not only to the individual hospital but to the community as a whole.

Functions of Standing Orders for the Nurses in Industry*

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A STANDING order may be defined as an order for some form of treatment, medication, or procedure to be carried out by a nurse in the absence of a doctor. To be valid, it must be written, signed by a doctor, and applicable to a specific patient or situation. Such orders are of particular value in a hospital where they provide for standardized procedure, expedite care and treatment of patients in the temporary absence of the doctor. If carefully examined, standing orders in recognized hospitals will be found to consist only of the usual techniques which a nurse is qualified to perform in those situations which require neither diagnosis nor prescription. Patients admitted to a hospital are usually seen by a physician before or upon admission. The standing orders of a staff doctor therefore, merely serve as a guide for nursing routine to be carried out in his absence on patients whose condition he has diagnosed. They define what the nurse is permitted to do with the doctor's approval in his absence.

The problem of standing orders for nurses who see patients before a doctor is available for diagnosis and prescription is different. Visiting nurses are frequently called upon to give care in a home before a physician arrives, and usually have standing orders to cover such situations. These orders are commonly formulated by a local public health agency and are very limited. They frequently do not even permit a visiting nurse to execute without a doctor's order, a procedure which could be classified as an ordinary home remedy. For instance, except in unusual cases such as a child in convulsion, standing orders of a well conducted public health department do not permit the giving of an enema without a specific order from the doctor. In fact, many organizations will not permit a second nursing visit on any case unless first seen by a doctor. Continued nursing care to a patient is rarely permitted without medical supervision. The attitude of these public health organizations is correct since they wish to protect the nurse from practising medicine, and realize that not only is the nurse not licensed or capable of practising medicine but that they do not have the authority to permit her to do so.

An analogous situation exists in industrial medicine where nurses are frequently called upon to work with inadequate or no medical supervision. In order to define their duties, in 1932 the Wisconsin State Medical Society issued "Suggestions for the Guidance of the Nurse in Industry." At the request of nurses, who under wartime conditions

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

were conducting medical departments in industry without the guidance of a physician, in 1943 the Council on Industrial Health of the American Medical Association issued "Standing Orders for Nurses in Industry." In this bulletin, it is suggested, where nurses are working without adequate medical supervision, that written orders be requested from the committee on industrial health of the local or state medical society. Industrial nurses have welcomed these orders and their official organizations consider it an evasion of responsibility on the part of a physician who refuses to sign standing orders for his nurse. The majority of industrial nurses maintain that this procedure gives them legal protection, greater prestige, and greater elasticity of function. Although not basic functions of standing orders, they do provide these benefits if they limit the nurse to nursing practice and truly represent medical supervision in the absence of the doctor.

Field experience with industrial medical departments of many types and sizes in various parts of the country convinces us that the real function of standing orders is not always understood by management, by the majority of nurses, and by many doctors. Generally, two types of interpretations are placed upon their function. One is that its purpose is to give the nurse more leeway than she normally should have, and standing orders really represent permission to practise medicine. We have seen many such orders where a doctor has given permission to the nurse to diagnose, treat, and even suture in his absence. The second type of interpretation is that it is a device to limit the nurse from doing anything but the simplest first aid and record keeping. This type of standing orders reduces the nurse to the status of a record clerk and first aider who refers everything to the physician. The most extreme example that we have seen is one in which a plant nurse (who was registered and qualified) was instructed in case of doubt to call the physician's office where, in his absence, she would receive instructions from his office nurse.

The term "standing orders" is used rather loosely to cover any act that a nurse may perform in absence of the doctor. Standing orders may be classified in two types—those that relate to situations which recur frequently and those that relate to treatment of a specific patient. The Standing Orders of the American Medical Association and other committees on industrial health are actually outlines for first aid procedures, and the original pamphlet issued by the Wisconsin State Medical Society is entitled "Suggestions for the Guidance of the Nurse in Industry." Nowhere is the word "Standing Orders" used, and in the foreword it is pointed out that it is approved only as an outline of first aid measures.

The necessity for defining the sphere of the nurses' functions in industry is evident in order to avoid a tendency to infringe on the practice of medicine. This situation may be due to management's desire to buy medical care cheaply which may lead the nurses to diagnose, treat, and even suture. They are commonly called upon to do preplacement physical examinations. Nurses, desirous of pleasing management accept the responsibility, but the more conscientious ones, wishing justification, demand standing orders from a doctor. Many standing orders are written by the nurse and signed by a doctor who has no clear concept of his responsibility and who is usually on an "on-call" basis having no responsibility to the plant first aid department except for treating cases as they arise. The nurse thinks that she is now permitted to do things she could not do before, management is satisfied in obtaining medical care for nurses' pay, and the doctor is untroubled as long as no liabil-

ity attaches to his act. Thus, what was intended as a curb on the practice of medicine is used as a license to do so. Doctors who realize their responsibility in creating standing orders refuse to sign equivocal orders which may be construed as permitting the nurse to practise medicine.

Orders which outline procedures for the emergency care of occupational injury or illness are not really standing orders but first aid guides suitable for industry at large, or for a particular industry where certain types of these injuries and illnesses are common. These procedures are carried out within the professional qualifications of a registered nurse without a doctor's authority. However, since each doctor has preferences, these guides state his specific wishes, or if written by a committee on industrial health, outline what is a generally acceptable procedure. Standing orders really relate to treatment of specific patients, and before they can be applied it is necessary that a diagnosis be made, e.g., a standing order for heat to a sprain implies that a diagnosis of sprain has been made. Making a diagnosis is legally the practice of medicine. It can be done only by an individual with proper training and qualifications who is licensed by law after passing an examination. Such authority cannot be delegated.

If medical supervision is adequate, standing orders are not needed, for example, in those industries where full-time plant physicians are in charge. A part-time plant physician whose responsibility is to supervise the nurse may properly issue standing orders to cover some situations in his absence. Since they represent the liaison between doctor and nurse they should be based upon the doctor's regard for the nurse's judgment and ability. In one plant a doctor was willing to write standing orders for one nurse but not for the other. The "on-call" doctor who has no in-plant responsibility could not and should not be asked to issue orders, but may properly issue a guide for the nurse to follow before referring the case to him. The type of cases which need referral will depend on the ability and professional judgment of the nurse.

It must be recognized that there is a twilight zone where a nurse may properly give care without actually practising medicine. In New York State, excluding injuries which require immediate intensive care such as suturing, the nurse is permitted two maneuvers as first aid measures, that is, care at the onset of injury and one specific redressing. A first aid guide may cover these situations, but continued treatment of the patient demands the services of a doctor. If a doctor visits the plant periodically, he will have the opportunity to see the patient and relieve the nurse of the responsibility of continued care without diagnosis.

One function of standing orders is to cover those minor injuries or illnesses which do not demand the services of a doctor. Another function of standing orders is to cover the gap between the initiation of treatment and the visit of the doctor. A third function is to provide standard acceptable procedures for patients with injuries and illnesses which occur frequently in industry. These orders must be created by a doctor, who is not only responsible for the plant medical department but is also responsible for the diagnosis of injured or ill workers. The true function of standing orders does not imply that everything be referred to the doctor. Such orders do not recognize that the nurse is a professionally qualified person who is able to recognize symptoms and signs and to apply nursing procedures which may be effective in safeguarding the life and health of the patient.

The most frequently repeated need for standing orders and the one given the greatest weight by the nurses is that

it affords them legal protection. This view is shared by a number of industrial physicians. It might be well at this point to define legally one who practises medicine. He is defined as "one who holds himself out as being able to diagnose, treat, operate, or prescribe for any human disease, pain, injury, deformity, or physical condition, and who shall offer or undertake, by any means or method to diagnose, treat, operate, or prescribe for any human disease, pain, injury, deformity, or physical condition." Individuals who are permitted to practise must fulfil certain qualifications as prescribed by law. It is obvious that no doctor can give permission for any other person to practise medicine, hence, no doctor can permit a nurse to diagnose, treat, prescribe, or operate. He can permit her to carry out some functions in his absence but must assume full responsibility. There is a definite difference between writing a specific order for a given patient and a standing order for a given condition which a nurse can presumably recognize before the doctor sees the patient. When a nurse carries out an order after the doctor has seen the patient, diagnosed the condition, and prescribed treatment, she is not practising medicine. If she must diagnose and treat then she is practising medicine although she may be following a standing order.

There is no record in New York State of any suit against an industrial nurse for practising medicine with or without standing orders. Legal counsel on this point advises that both the doctor and nurse would be considered responsible if she carried out an order signed by him which could be construed as practising medicine. It is presumed that the nurse knows her limitations, and should refuse to carry out an order beyond her capacities. The law assumes that if the procedure carried out in some cases was within allowable nursing techniques the court would not consider her completely guilty. It is interesting to note one case in which a nurse was considered practising medicine, who, under direct and personal supervision of a physician, incised the skin in order to enter a vein for a venoclysis. This was considered beyond the scope of nursing.

Every injury in a plant requires first aid treatment, and since the registered nurse is trained to recognize cause and effect of diseases, she is able to take certain measures which are not known to the laymen. For instance, she is trained to care for drugs and to measure dosage accurately, to know the toxicologic effects, and if in an emergency she used these drugs properly it would not be interpreted as the practice of medicine. Legal opinion varies but most lawyers agree that in a serious injury such as a compound fracture, the nurse who gives morphine as an emergency measure before the doctor arrives would not be considered guilty of practising medicine.

To understand the real function of standing orders it is necessary to differentiate clearly between a standing order for treatment as opposed to the so-called standing orders on procedure. The Council of Industrial Health of the American Medical Association, while calling their bulletin "Standing Orders for Nurses," actually promulgated a guide for nursing procedure on injuries and illnesses that may occur within a plant. Such guides on procedures very properly can be issued by medical organizations interested in the field. Real standing orders, however, refer to the treatment of specific patients and can be written only by a doctor who is actively and personally in charge of a dispensary and has the opportunity to see the patient. The "on-call" doctor who is not given direct responsibility for treatment of the cases cannot write valid standing orders but can approve a guide to procedure. The nurse in industry cannot use standing orders from

such a doctor as a substitute for personal medical attention.

Standing orders are meaningful and exercise their true function only when they represent medical supervision in the doctor's absence. Standing orders are not a substitute for medical care and cannot replace the doctor in industry. The practice of industrial medicine will benefit when management, the industrial physician, and the industrial nurse recognize this fact.

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Use of Body Measurements in the School Health Program

Part III. Supplementary Note Supplying Measurement and Rating Equivalents for Thickness of Skin and Subcutaneous Tissue below Left Scapula and above Left Ilium

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IN Part I of this article[1] the writers recommended that in school health examinations "as a minimum routine of anthropometry seven determinations be made" (p. 1369). The determinations proposed included five measurements (body weight, standing height, chest circumference, hip width, and leg girth) and two ratings (clinical appraisal of amount of subcutaneous tissue in two regions—"slightly below and a little lateral to the inferior angle of the left scapula" and "immediately above the crest of the left ilium" p. 1375).

Part II of the article (p. 1373) discussed specific procedures to be followed and illustrated interpretation of results. It was proposed that the two ratings of subcutaneous tissue be made using a five category scale and employing the symbols +, ++, +++, ++++, +++++.

In deciding whether to recommend *ratings* or *measurements* of the quantity of subcutaneous tissue, the writers faced a difficult choice. The advantages of "reliable measurement" were recognized and cognizance was taken of the fact that "a special spring calipers was available for measuring the thickness of folds of skin and subcutaneous tissue." On the other hand, it was apparent that most school physicians are experienced in making subjective ratings of fatty tissue, while few are proficient in its measurement. We were agreed that "it would not lead to desirable results" to recommend the use of the available instrument "unless the school physician and his assistants were willing to take sufficient time to become skilled in its application" (p. 1369). Our general recommendation was that the quantity of subcutaneous tissue be appraised using the rating approach.

In making this recommendation we did not minimize the fact that the assignment of valid ratings "presupposes a background of information and experience" (p. 1375). It was emphasized that competence as a rater presumes the knowledge that the thickness of the subcutaneous tissue below the scapula and above the ilium "tends to increase with age during the school years and to be greater at any given age in females than in males. It further assumes considerable clinical experience in making judgments of subcutaneous tissue in these areas—experience affording a working familiarity with the range of individual differences found in given age-sex groups" (p. 1375).

The need has arisen for publication of measurement equivalents for ratings +, ++, +++, ++++, +++++. It is to meet this need that Part III has been prepared.

As one might expect, the requests for tables of measurement and rating equivalents have come in part from school health personnel and in part from scientists engaged in research on physical growth or health appraisement. Among the school health personnel, two groups of workers are represented; those trained to use the especially designed instrument recommended by Franzen for measurement of thickness of skin and subcutaneous tissue, and those desirous of obtaining such training. The former group registered a preference for measurements as their basic data. The latter group were turning to measurements either as a means of periodically checking the validity of their ratings or because they had come to question their ability to take age, sex, and individual variation into account as they made ratings.

The sample of children on whom measurement data were accessible was the same as that used in deriving the norms presented in Part II for weight, height, chest circumference, hip width and leg girth. To recapitulate: the subjects were "white children living in or near Iowa City, Iowa. . . . all were in attendance at the University of Iowa experimental elementary and high schools during one or more of the years 1930 through 1945. Their parents were almost exclusively American born and their grandparents predominantly American born. Over 90 per cent of the children were of northwest European ancestry, while only a scattering were of southeast European descent. Approximately 40 per cent of the fathers were professional men (mainly members of

TABLE 1

Measurement and Rating Equivalents for Thickness of Skin and Subcutaneous Tissue Above Crest of Left Ilium. Readings on Franzen-type Calipers are Presented to Correspond With Ratings of +, ++, +++, ++++, +++++

Age (Yrs.)	+	++	+++	++++	+++++
			Boys		
4	12–13	14	15–17	18–19	20 and up
5	11–12	13	14–16	17–19	20 and up
6	10–11	12–13	14–15	16–18	19 and up
7	10–11	12–13	14–15	16–19	20 and up
8	10–11	12–13	14–15	16–19	20 and up
9	10–11	12–13	14–16	17–20	21 and up
10	10–11	12–13	14–17	18–22	23 and up
11	11–12	13–14	15–17	18–23	24 and up
12	11–12	13–14	15–17	18–22	23 and up
13	11–12	13–14	15–17	18–21	22 and up
14	11–12	13–14	15–17	18–21	22 and up
15	11–12	13–14	15–17	18–21	22 and up
16	11–12	13–14	15–17	18–21	22 and up
17	11–12	13–14	15–18	19–21	22 and up
18	11–12	13–14	15–18	19–21	22 and up
			Girls		
4	13–14	15–16	17–19	20–22	23 and up
5	12–13	14–15	16–19	20–22	23 and up
6	11–13	14–15	16–18	19–21	22 and up
7	11–13	14–15	16–19	20–22	23 and up
8	12–14	15–16	17–20	21–23	24 and up
9	12–14	15–16	17–20	21–25	26 and up
10	12–14	15–17	18–21	22–27	28 and up
11	13–15	16–18	19–22	23–28	29 and up
12	13–15	16–18	19–22	23–28	29 and up
13	14–16	17–19	20–23	24–29	30 and up
14	14–16	17–19	20–24	25–29	30 and up
15	15–17	18–20	21–25	26–31	32 and up
16	15–17	18–21	22–26	27–32	33 and up
17	15–18	19–21	22–26	27–31	32 and up
18	15–18	19–21	22–25	26–30	31 and up

university faculty); 35 per cent business proprietors, managers, or skilled trade employees; 15 per cent farmers; and the remaining 10 per cent clerks, carriers, or semi-skilled laborers. The only rejections were rare instances of gross physical pathology" (p. 1384).

Thickness of skin and subcutaneous tissue was measured (1) in the region slightly below and a little lateral to the inferior angle of the left scapula, and (2) in the region immediately above the crest of the left ilium. In each instance, the method employed was that of so placing the measurer's left hand that its palmar surface faced the region of measurement and its first two digits were (a) in an opposable relationship, (b) directed caudally, (c) separated by a distance of approximately 30 to 40 mm., and (d) in contact with the subject's epidermis. The two digits (thumb and index finger) were then moved directly toward each other in such a manner that a *complete double layer* of the subject's skin and subcutaneous tissue was elevated between them. This elevated fold was held with sufficient firmness to keep its two layers in contact, and the instrument applied to it with the right hand. The flat, blunt-nosed branches of the instrument gripped the fold at the site immediately distal to the tips of the thumb and index finger of the measurer's left hand. After reading off the thickness recorded on the instrument scale, (a) the instrument was removed and (b) the fold slowly released.

Measurements were made on the nude trunk. The objective of the measurer was to draw together a complete double layer of skin and subcutaneous tissue without including any of the underlying

TABLE 2

Measurement and Rating Equivalents for Thickness of Skin and Subcutaneous Tissue Below Left Scapula. Readings on Franzen-type Calipers Are Presented to Correspond With Ratings of +, ++, +++, ++++, +++++

Age (Yrs.)	+	++	+++	++++	+++++
			Boys		
4	10–11	12	13–14	15	16 and up
5	10–11	12	13–14	15	16 and up
6	10–11	12	13–14	15	16 and up
7	10–11	12	13–14	15–16	17 and up
8	10–11	12	13–14	15–16	17 and up
9	10–11	12	13–14	15–16	17 and up
10	10–11	12	13–14	15–17	18 and up
11	11–12	13	14–15	16–18	19 and up
12	11–12	13	14–15	16–18	19 and up
13	11–12	13	14–15	16–18	19 and up
14	11–12	13	14–15	16–18	19 and up
15	12–13	14	15–16	17–18	19 and up
16	12–13	14	15–16	17–18	19 and up
17	12–13	14	15–16	17–18	19 and up
18	12–14	15	16–17	18–19	20 and up
			Girls		
4	11–12	13	14–15	16–17	18 and up
5	11–12	13	14–15	16–17	18 and up
6	11–12	13	14–15	16–17	18 and up
7	11–12	13	14–15	16–18	19 and up
8	11–12	13	14–16	17–19	20 and up
9	11–12	13–14	15–17	18–20	21 and up
10	11–12	13–14	15–17	18–21	22 and up
11	11–13	14–15	16–18	19–22	23 and up
12	11–13	14–15	16–18	19–22	23 and up
13	12–14	15–16	17–19	20–23	24 and up
14	12–14	15–16	17–20	21–24	25 and up
15	13–15	16–17	18–21	22–25	26 and up
16	14–15	16–17	18–21	22–26	27 and up
17	15–16	17–18	19–22	23–27	28 and up
18	15–16	17–18	19–22	23–27	28 and up

muscle tissue. Always one or two trial folds were taken in order to adapt the interdigital distance to the firmness and amount of subcutaneous tissue of the individual subject. During measurement, there was constant alertness to see that none of the subcutaneous tissue slipped from between the digits or the branches of the instrument. In the case of the supra-iliac measurement, the calipers were applied approximately 20 mm. superior to the crest of the left ilium in a line vertical with the left axilla. For the measurement on the back of the thorax, the calipers were applied approximately at the intersection of a transverse plane passing through the xiphoid cartilage and a sagittal plane lying midway between the sternum and the lateral wall of the thorax.

The assignment of measurement values to rating categories was made as follows: the lowest 10 per cent of the values for a given age and sex were assigned to category +, the next 20 per cent to category ++, the middle 40 per cent to category +++, the next 20 per cent to category ++++, and the highest 10 per cent to category +++++. Tables 1 and 2 present the results.

Although no further explanation of Tables 1 and 2 is essential, a few statements directly referring the reader to them may serve to elucidate their construction and facilitate their use. Table 1 shows that of the boys age 6 on whom supra-iliac measurements were obtained, 10 per cent gave readings on the Franzen-type spring calipers of 10 or 11, 20 per cent readings of 12 or 13, 40 per cent readings of 14 or 15, 20 per cent readings of 16, 17, or 18, and 10 per cent readings of 19 or higher.* Girls age 6 will be seen to yield systematically larger readings; for example, while readings of 14 and 15 are "average" records on the boys they are "below average" records on the girls. In terms of rating assignments, given a boy and girl age 6 each with tissue thickness readings of 14, the boy falls in category +++ and the girl in category ++. For tissue thickness readings of 17, rather than 14, the category allocations are +++ in the case of a girl and ++++ on a boy.

Table 2 exhibits the same general age trends and sex relationships as Table 1. Note, for instance, that boys falling in category ++++ at age 5 have the same tissue thickness as girls falling in category +++ at age 5, in category ++ at age 11, and in category + after age 15. Similarly, girls falling in category ++ at ages 15 and 16 have the same tissue thickness as boys falling in category +++++ at age 4, in category ++++ at age 11, and in category +++ at age 18.

Summarizing, this publication constitutes a supplementary note to "Use of Body Measurements in the School Health Program."[1] It provides school health workers with measurement and rating equivalents for thickness of skin and subcutaneous tissue in two regions —above the ilium and below the scapula. Tables of equivalents for normative use are presented on each sex covering the age period 4 to 18 years. The data utilized in constructing the tables were collected 1930–1945 on Iowa City children of northwest European ancestry attending the University of Iowa experimental schools.

* For the benefit of those interested in the absolute thickness of skin and subcutaneous tissue during childhood and adolescence, it should be stated that these readings are not in millimeters. In order to obtain the millimeter thickness of a single layer of measured tissue one must first subtract 6 and then divide by 2. Hence, a calipers reading of 10 corresponds to a single layer thickness of 2 mm., a reading of 20 to a single layer thickness of 7 mm., and a reading of 30 to a single layer of thickness of 12 mm.

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Simplified Procedure for the Collection of Basic Data for Dental Program Planning and Appraisal*

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AT no time in the brief history of this organization has the outlook been as encouraging as it is today for the effective application of procedures for controlling the hazards to dental health. Some of the developments and activities which provide the basis for this optimism are:

1. Demonstrations now in progress which hold great promise for the early development of positive methods of preventing specific dental diseases.
2. Widespread endorsement by members of the dental profession of a program to increase dental research facilities and activities, to facilitate education of the public in matters relating to dental health, and to make dental health services available to all.
3. The initiation and sponsorship of legislation which would provide specific financial support for a broader program of research, education, and service.
4. Current dental surveys containing specific provisions for the collection of basic data for community program planning, their use heretofore having been largely limited to epidemiological studies on dental diseases.

To all of us who participate in this increased activity will come greater opportunities for service and heightened enthusiasm in our work program. With these opportunities also will come, to the dental profession and to us as individuals, correspondingly greater responsibilities. Each increase in public investment for improved dental health, whether in the form of coöperative endeavor, financial support, or both, will enlarge our obligation to provide objective evaluations of our performances.

Increased support of dental health programs—research, education, prevention, and treatment—will be given on the promise of dividends in dental health. Our advance estimates of those dividends may be based on factual information regarding proven control procedures or largely on presumptive evidence. Support based on the latter type of evidence is exemplified by the current willingness of large population groups to finance the artificial fluorination of public water supplies. Although all available data sustain the premise that fluorinated water will reduce the incidence of dental caries, this working hypothesis has not been verified. Yet six cities in this country are now adding fluorine to their water supplies, several cities have formulated concrete plans for fluorination, and numerous others are considering the feasibility of doing likewise.

Thus, it is clear that opportunities to apply methods for improving dental health—methods based on fact or on theory, or both—will increase with expanded support of dental health programs. It is not our intention here to

* Presented before the Dental Health Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 12, 1946.

TABLE 1

*Number of Decayed, Missing, and Filled Permanent Teeth and Per cent of Children with One or More DMF * Permanent Teeth, by Age, for 6,257 Hagerstown, Maryland, Children (White), 2,627 Nicollet County Children (White), and 1,272 Baltimore, Maryland, Children (Negro)* [3,4]

	Age Last Birthday												
	6	7	8	9	10	11	12	13	14	15	16	17	18
	Hagerstown, Maryland, Children (White)												
Number of children	327	403	487	493	529	531	596	565	695	651	445	355	148
Carious, to be filled (D) †	81	259	454	706	849	920	1,250	1,402	2,124	2,037	1,302	829	368
Missing, extracted or extraction indicated (M)	1	11	25	90	156	163	275	375	572	698	537	503	297
Filled (F)	13	25	110	213	347	455	684	826	1,296	1,692	1,455	1,479	652
DMF * Teeth	95	293	583	994	1,329	1,510	2,179	2,573	3,907	4,322	3,193	2,743	1,290
DMF Teeth per person	0.29	0.73	1.20	2.02	2.51	2.84	3.66	4.55	5.62	6.64	7.18	7.73	8.72
Per cent of children with one or more DMF Teeth	15.9	36.2	53.4	70.6	78.3	81.9	87.8	90.8	95.3	96.5	100.0	94.3	95.1
	Nicollet County Children (White)												
Number of children	259	252	276	282	276	265	289	231	159	142	93	79	24
Carious, to be filled (D) †	113	258	368	443	468	524	673	621	407	431	206	171	56
Missing, extracted or extraction indicated (M)	1	2	16	20	29	50	111	74	87	116	95	87	26
Filled (F)	20	112	274	373	489	599	891	828	786	863	604	623	197
DMF * Teeth	113	360	636	805	937	1,103	1,589	1,459	1,223	1,366	891	856	269
DMF Teeth per person	0.51	1.43	2.30	2.86	3.39	4.16	5.50	6.32	7.69	9.62	9.58	10.84	11.21
Per cent of children with one or more DMF Teeth	24.3	53.6	75.7	84.0	86.2	89.8	92.7	95.2	94.3	98.6	97.8	93.7	100.0
	Baltimore, Maryland, Children (Negro)												
Number of children	164	199	233	240	213	138	85	....	....	....	....	....	....
Carious, to be filled (D) †	41	112	201	303	311	221	164	....	....	....	....	....	....
Missing, extracted or extraction indicated (M)	1	2	6	19	34	20	24	....	....	....	....	....	....
Filled (F)	0	3	12	10	10	9	5	....	....	....	....	....	....
DMF * Teeth	42	117	217	331	352	248	190	....	....	....	....	....	....
DMF Teeth per person	0.26	0.59	0.93	1.38	1.65	1.80	2.24	....	....	....	....	....	....
Per cent of children with one or more DMF Teeth	14.6	34.2	48.5	57.9	66.2	68.1	72.9	....	....	....	....	....	....

* Decayed, missing, or filled teeth. A tooth both decayed and filled is counted as one DMF tooth.
† All teeth with one or more untreated carious areas except those teeth indicated for extraction.

discourage the utilization of such opportunities to test out on a field trial basis the methods which are unproved. Rather, it is our purpose to urge that all methods and the results of their application be subjected to periodic appraisal.

The workshop technique and the problem-solving approach are terms used today more or less synonymously with program planning. They are founded on the principle that "no health department, state or local, can effectively control disease without knowledge of when, where, and under what conditions cases are occurring."[1] Such knowledge is a prerequisite of effective program planning.

In collecting information on the nature and extent of the dental health problems of a community, answers to specific and pertinent questions are sought. How prevalent are dental diseases? What are the objective consequences of such diseases? What can be done to control them? What are the community resources for sustaining an effective control program? How can those resources be supplemented and increased in effectiveness? What will the program cost? How can the proposed program be evaluated? Although program evaluation is last on this list of subjects for consideration, there is good reason to believe that it should receive first attention. Just as writing the conclusion of a paper provides direction and purpose to the writing of the body and introduction of the paper, so a definition of the methods to be used in the evaluation or appraisal of a dental program will provide direction and purpose to program planning.

The objective of any program for the

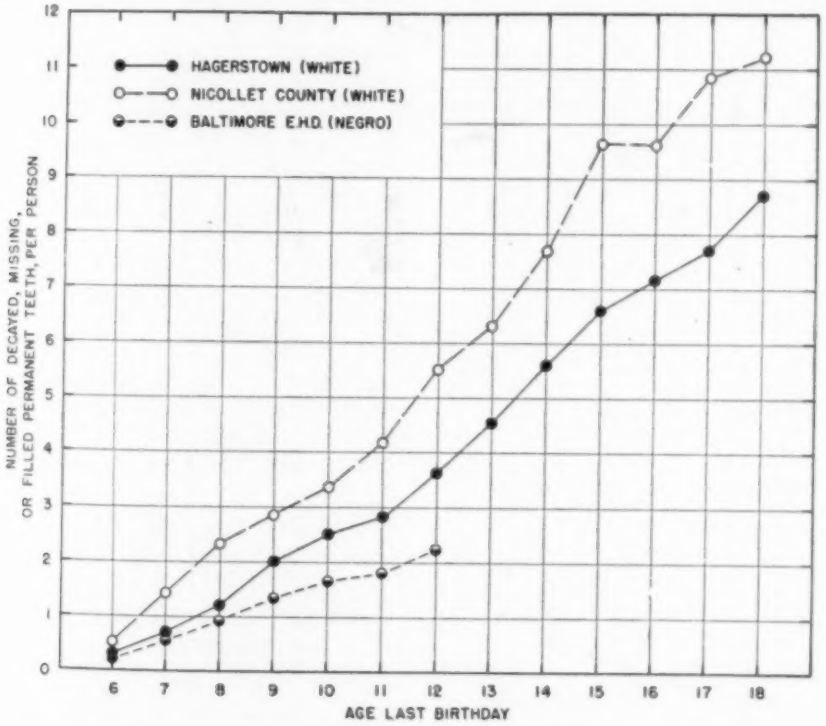

FIGURE 1—Number of Decayed, Missing or Filled (DMF) Permanent Teeth per Person, by Age, for 6,257 Hagerstown, Md., White Children, 2,627 Nicollet County, Minnesota, White Children, and 1,272 Baltimore, Md., Negro Children

control of a specific disease is the elimination or reduction of the consequences of the disease such as illness, disability, or death. Control may be accomplished through the application of preventive or treatment methods. The first of these may be used to eliminate the consequence of the disease through the prevention of its occurrence, whereas the latter may be used to lessen or mitigate the disease or to interrupt its course. Whichever method is used it is essential, in both the planning and the appraisal of the control program, that the prevalence of the disease and its consequences be known.

The prevalence of dental caries, for example, may be measured for the permanent teeth in terms of the average number of decayed, missing, or filled teeth per person, by age. This unit of measurement is adequate for all practical purposes for the age groups 6 through 30 or 35 years, since dental caries is the major cause of loss of permanent teeth during this age span.

Numerous dental surveys have demonstrated that the prevalence of dental caries varies greatly from community to community as well as racially.[2, 3, 4] An example of this variation is illustrated in Figure 1 (Table 1). The average number of DMF permanent teeth per child for Nicollet County, Minnesota, white children increases from 0.5 at 6 years of age to 5.5 at 12 years of age and to 11.0 at the age of 18 years; for Hagerstown, Md., white children, the increase is from 0.3 at the age of 6 years to 3.7 at age 12, and to slightly less than 9.0 at age 18. On the other hand, Negro children of Baltimore show an increase from 0.2 at age 6 to slightly more than 2.0 DMF teeth at age 12, the oldest age for which data are available on this last group of children.

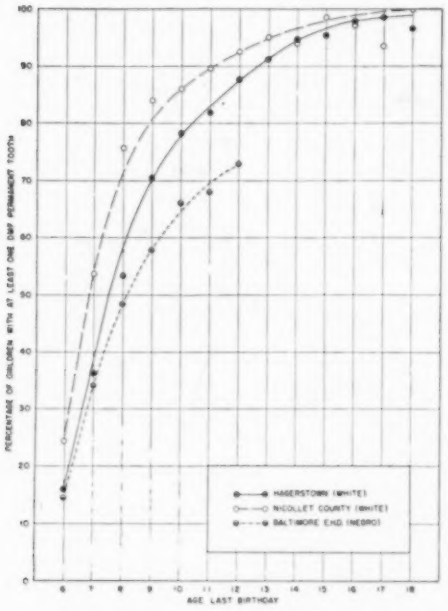
PERCENTAGE OF CHILDREN WITH AT LEAST ONE DMF PERMANENT TOOTH
AGE LAST BIRTHDAY
HAGERSTOWN (WHITE)
NICOLLET COUNTY (WHITE)
BALTIMORE EXT. (NEGRO)

FIGURE 2—Percentage of Children with at Least One DMF (Decayed, Missing or Filled) Permanent Tooth, by Age, for 6,257 Hagerstown, Md., White Children, 2,627 Nicollet County, Minnesota, White Children and 1,272 Baltimore, Md., Negro Children

It should be noted that the age-specific prevalence of dental caries for each of the three groups of children increases yearly in a straight line manner. Thus the yearly incidence of dental caries can be readily calculated. For Nicollet County white children the incidence would be 11/12 of a DMF tooth per child per year, for Hagerstown white children ¾ of a DMF tooth, and for Baltimore Negro children 1/3 of a DMF tooth.

Another measure of the prevalence of dental caries in permanent teeth of the children of a community is the proportion of children having the disease by age. An illustration of the character of such information and the differences among the three groups of children previously referred to is presented in Figure 2. It will be noted that beginning with age 6 years the percentage of children having dental caries in permanent teeth increases with age and the rate of increase is different for each of the population groups. At age 12 years, for example, the percentage of children

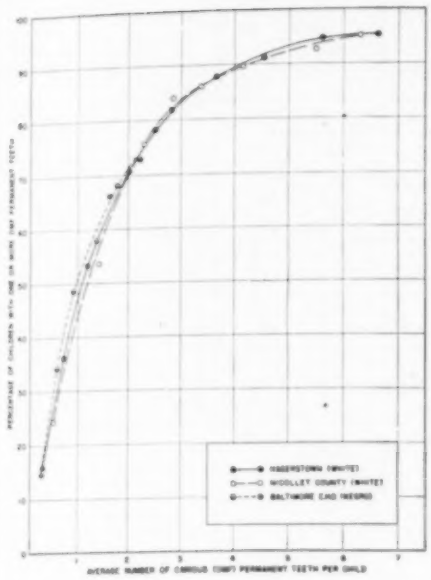

FIGURE 3—Relationship of the Per cent of Children with One or More DMF (Decayed, Missing or Filled) Permanent Teeth to the Average Number of DMF Permanent Teeth per child (Paired Age Values), for 5,277 Hagerstown, Md., Children (White), 2,289 Nicollet County, Minnesota (White), and 1,272 Baltimore, Md., Children (Negro)

having caries experience is 93 for Nicollet County whites, 87 for Hagerstown whites, and only 73 for Baltimore Negroes.

Thus it is evident from Figures 1 and 2 that both the percentage of children in a community who have dental caries and the average number of affected teeth per child vary from community to community and that they vary in the same direction. This latter observation led to a study of the relationship of these two measurements to each other and the results of that study are indicated in Figure 3. A common curve results from a plot on arithmetic graph paper, of the paired values, percentage of children having caries, and average number of DMF permanent teeth per child, by age, for each group of children. This curve is of the catalytic type (Figure 4) and is described by the equation $97-y = 97\ (0.524)^x$. A discussion of the formulation, validity, and use of the curve has been presented previously.[4] It is of considerable importance that the establishment of a standard curvilinear relationship between the two variables permits accurate estimates of the average number of carious permanent teeth per child from observed proportions of children with one or more decayed permanent teeth.

One of the consequences of untreated dental caries is tooth loss. The manner in which this finding varies among the groups of children discussed here is presented in Figure 5. It will be noted that the tooth mortality rate for individuals aged 18 years is two per child for Hagerstown whites, and slightly more than one per child for Nicollet County white children. In view of the previous determination of a higher caries prevalence among Nicollet County

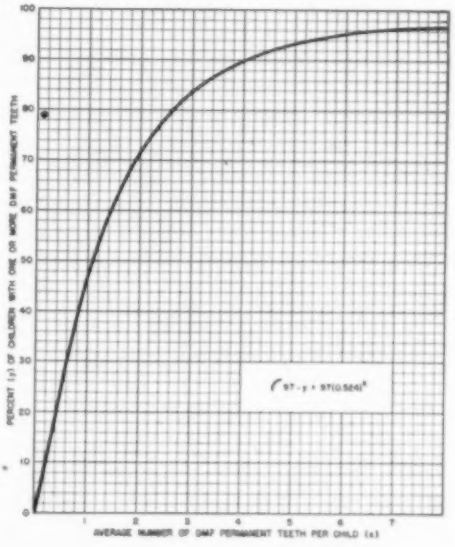

FIGURE 4—A Graph for Estimating the Average Number of DMF Permanent Teeth per Child from the Determined Percentage of Children, by Age, Showing Evidence of at Least One DMF (Decayed, Missing or Filled) Permanent Tooth

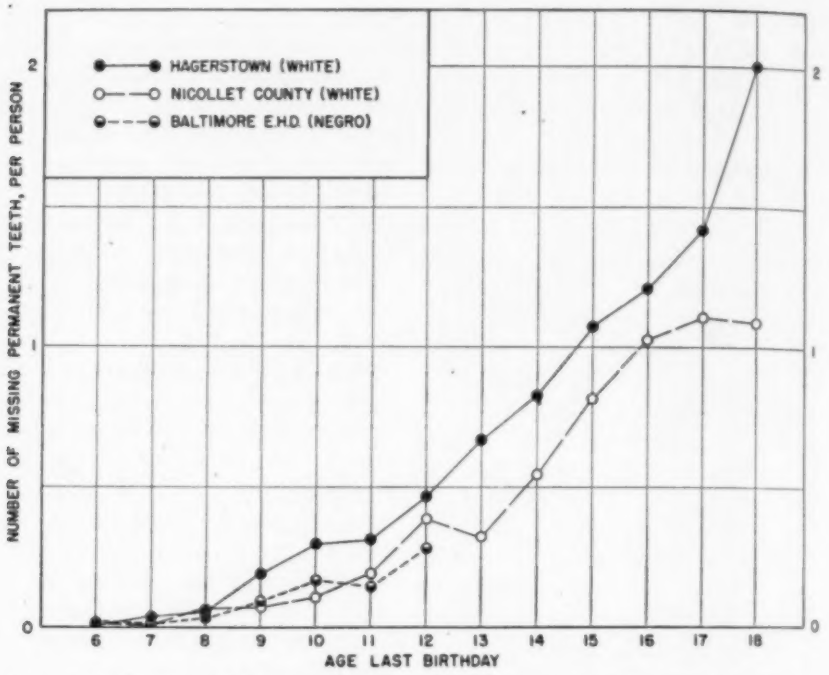

FIGURE 5—Number of Missing (Extracted or Extraction Indicated) Permanent Teeth, per Person, by Age, for 6,257 Hagerstown, Md., White Children, 2,627 Nicollet County, Minnesota, White Children, and 1,272 Baltimore Md., Negro Children

children than among Hagerstown children, the relative tooth loss rates are the reverse of the expected order. In explanation of this reversal, it is noteworthy that the rates for teeth filled were approximately twice as high for Nicollet County as for Hagerstown children.[5] The comparatively low tooth mortality among Baltimore Negro children is a direct reflection of the relatively low caries experience rates.

A justification of the use of tooth mortality rates as an index for the appraisal of a dental program has been presented previously by several investigators.[5, 6, 7] Reduction in tooth loss rates is one of the principal aims of a dental caries control program, whether control is to be effected by preventive or treatment procedures. Evidence on treatment procedures has just been presented. Evidence of the type of reduction in tooth loss rates which might be expected from preventive measures is afforded by these findings: in communities of characteristics similar except for the fluoride content of the water supply, children whose drinking water is fluoride-free have four to six times as many lost permanent teeth as have children in areas with 1 to 2 p.p.m. of F in the water supply.[8, 9]

The evaluation of a dental treatment program, using tooth mortality rates and the simplified index for determining dental caries prevalence, may be illustrated by the results obtained in an attempt to appraise a county dental program in operation for approximately 5 years.[10] The base line data on caries prevalence and tooth mortality were obtained from records of detailed dental examinations made with mouth mirror and explorer in the fall of 1940 when the treatment program was initiated. The examinations of the 2,627 children

DENTAL SURVEY

COUNTY Nicollet SCHOOL District No 39 EXAMINER W A Jordan
CITY Rural ADDRESS _____ DATE 4-24-46

NAME OF PUPIL	AGE	SEX	PERMANENT TEETH (EXCEPT FOR FILLINGS)						REMARKS
			DMF	FILLINGS		MISSING			
				P	D	EXTRACTION INDICATED	EXTRACTED	TOTAL	
Jones, Mary	9	F	+	+	+	0	0	0	
Smith, Jane	9	F	0	0	0	0	0	0	
White, Peter	9	M	+	0	0	6	16	2	
Black, John	9	M	+	+	0	0	0	0	2 Congenitally Missing
Mans, Norm	9	M	+	0	0	0	6 6	2	
Lee, James	9	M	+	+	+	6	0	1	

P=Permanent, D=Deciduous

FIGURE 6—Dental Survey Form for Recording Evidence of One or More DMF Permanent Teeth, Filled Permanent Teeth and Filled Deciduous Teeth; and for Recording Permanent Teeth Extracted or Indicated for Extraction

enrolled in the public and parochial schools of the 4 urban centers and 44 rural districts were completed by a dentist and a recorder in a two month period. When the children to be examined are readily available, however, approximately 100 such examinations can be performed in a day. Decoding and processing of the dental examination records required three clerk-months.

The appraisal technic applied in the spring of 1946 was based essentially on information regarding the presence of one or more DMF permanent teeth, and tooth mortality. The former was recorded as plus or minus and the latter by noting teeth extracted and teeth indicated for extraction. Supplemental information not essential to the appraisal consisted of data on the presence or absence of one or more fillings in permanent and in primary teeth. The latter items were recorded as plus or minus. The tongue blade only was used in making this appraisal survey. The record form used is reproduced in Figure 6. An examiner assisted by a recorder completed the inspections in the equivalent of 9 days. Processing of the data was completed in less than one clerk-week. It is of considerable interest that approximately 1,000 children can be inspected per day by a dentist using this simplified procedure if the children are readily available.

A comparison of the prevalence of dental caries in permanent teeth for the years 1940 and 1946 is presented in Figure 7 (Table 2). It will be noted that for children aged 6 through 11 years the percentages are consistently lower for 1946 than for 1940, but that they are quite similar for children aged 12 to 18 years. Since the mouth mirror and explorer were used in making the examinations in 1940, whereas the tongue

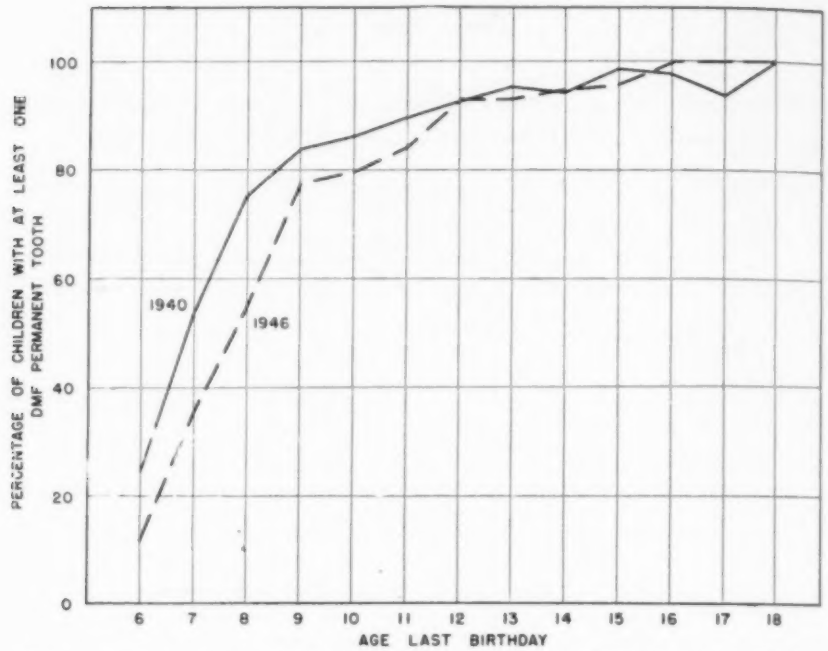

FIGURE 7—Percentage of Children with at Least One DMF (Decayed, Missing or Filled) Permanent Tooth, by Age, for 2,627 Nicollet County, Minnesota, School Children in 1940 and 2,310 in 1946

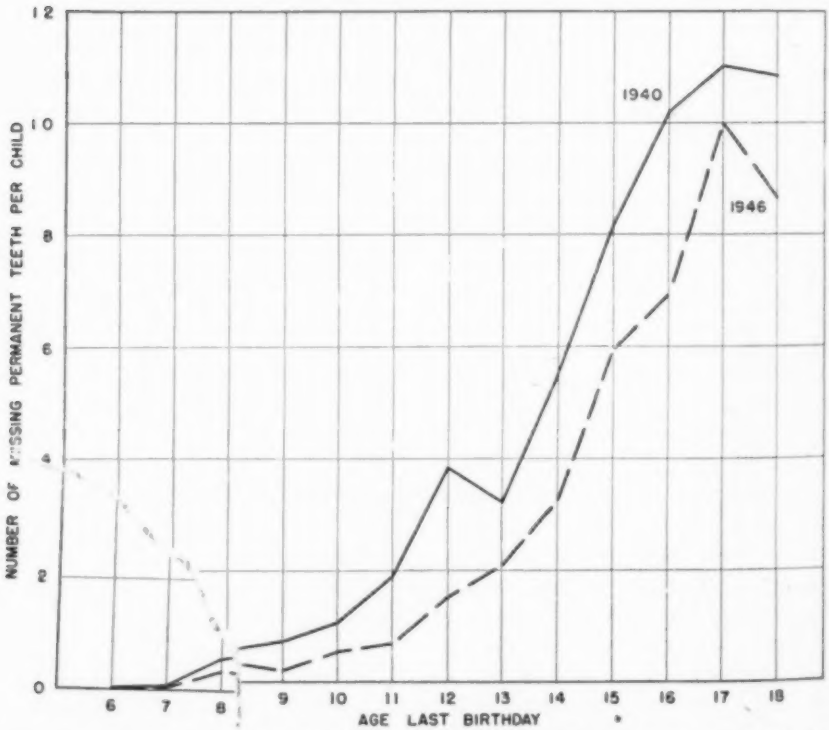

FIGURE 8—Tooth Mort ality, by Age for 2,627 Nicollet County, Minnesota, School Children in 1940 and 2,310 in 1946

TABLE 2

Number of Children Examined, by Age, and Number and Percentages of Children Affected by Specified Dental Conditions, among 2,627 Children in 1940 and 2,310 in 1946, for Nicollet County, Minnesota [10]

	Age Last Birthday												
	6	7	8	9	10	11	12	13	14	15	16	17	18
	Age Distribution of Children												
1940	259	252	276	282	276	265	289	231	159	142	93	79	24
1946	164	269	235	252	219	247	207	235	172	120	91	77	22
	Number of Children With at Least One DMF Permanent Tooth*												
1940	63	135	208	237	238	238	268	220	150	140	91	74	24
1946	19	95	129	195	175	208	192	219	163	115	91	77	22
	Percentage of Children With at Least One DMF Permanent Tooth*												
1940	24.3	53.6	75.4	84.0	86.2	89.8	92.7	95.2	94.3	98.6	97.8	93.7	100.0
1946	11.6	35.3	54.9	77.4	79.9	84.2	92.8	93.2	94.8	95.8	100.0	100.0	100.0
	Number of Missing† Permanent Teeth												
1940	1	2	16	20	29	50	111	74	87	116	95	87	26
1946	0	1	9	5	12	17	31	49	64	71	63	77	19
	Number of Missing† Permanent Teeth, per Child												
1940	0.004	0.008	0.058	0.071	0.105	0.189	0.384	0.320	0.547	0.817	1.002	1.101	1.083
1946	0.000	0.004	0.038	0.020	0.055	0.069	0.150	0.209	0.327	0.592	0.692	1.000	0.864
	Number of Children With at Least One Filled Permanent Tooth												
1940	10	43	101	129	154	161	200	166	118	115	84	72	22
1946	10	83	117	182	160	202	180	213	159	110	88	76	21
	Percentage of Children With at Least One Filled Permanent Tooth												
1940	3.9	17.1	36.6	45.7	55.8	60.8	69.2	71.9	74.2	81.0	90.3	91.1	91.7
1946	6.1	30.9	49.8	72.2	73.1	81.8	87.0	90.6	92.4	91.7	96.7	98.7	95.5
	Number of Children With at Least One Filled Deciduous Tooth												
1940	84	107	99	119	82	47	16	7	2	3	0	0	0
1946	88	173	136	149	94	68	22	7	3	0	0	0	0
	Percentage of Children With at Least One Filled Deciduous Tooth												
1940	32.4	42.5	35.9	42.2	29.7	17.7	5.5	3.0	1.3	2.1	0.0	0.0	0.0
1946	53.7	64.3	57.9	59.1	42.9	27.5	10.6	3.0	1.7	0.0	0.0	0.0	0.0

* Decayed, missing, or filled teeth. A tooth both decayed and filled is counted as one DMF tooth.
† Extracted teeth and teeth indicated for extraction.

blade only was used in making the inspections in 1946, it seems likely that the differences for children aged 6 to 11 years is a reflection of differences in technique rather than a true difference in caries experience. It is during the age span 6 to 11 years that the first objective evidence of caries in the permanent teeth appears in a relatively large proportion of children. On the other hand, the frequency of such evidence is much greater in children 12 to 18 years old.

Comparison of the tooth mortality rates is presented in Figure 8. The rates are consistently lower for each age in 1946 than in 1940 and the overall reduction is approximately 30 per cent.

Information on the proportion of children having one or more filled permanent teeth is presented in Table 2. Roughly 20 per cent more children examined in 1946 had one or more fillings in permanent teeth than children examined in 1940. The relatively high filling experience in 1940 is noteworthy, however, since the findings for this year are used as the basis for demonstrating a further extension of dental service under the program.

According to the data presented in Table 2, a rather marked increase in the proportion of children with one or more filled deciduous teeth was accomplished through the dental program. For

the ages 6 to 12, approximately 50 per cent more children had fillings in deciduous teeth in 1946 than in 1940. It should be emphasized, however, that the information obtained and presented on dental fillings is not essential to basic program evaluation.

Neither program content nor volume of service should influence a clear-cut appraisal of how much control has been effected by a caries control program. For this limited purpose measurements of caries prevalence and tooth mortality are the basic essentials. Many other things of a routine bookkeeping nature must be considered in the complete evaluation of a dental program, such as administrative, educational, and service costs. These have meaning only, however, when related to the relative accomplishments of the program in terms of reduced consequences of dental disease.

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The Union Contract and Industrial Hygiene*

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THE union contract, now more commonly known as "Union Agreement," is a mutual agreement between the union and the employer, and defines among other things the terms and conditions of employment. According to *Bulletin No. 686* of the U. S. Bureau of Labor Statistics,[1] issued in 1942, the number of union agreements at that time exceeded 50,000, and today in view of the impetus given to a better understanding of labor-management relationships by the activities of the late lamented War Labor Board, the number has been increased greatly.

Although the union agreement is regarded by some people as an anesthetic for the extraction of undue benefits from either management or labor, in reality, it represents an instrument for the better understanding by both parties of those elements or factors which make for sounder labor-management relations and for the improvement of conditions under which industrial practices may be expected to give the maximum results.

In recent years collective bargaining has played an important role in the development of group health insurance and sickness benefit programs. The U. S. Bureau of Labor Statistics reports[2] that "an increasing number of unions have succeeded in having health-benefit plans included in the terms of their agreements with employees, and several international unions have established special facilities for helping their locals negotiate such plans. Although a number of the provisions in current agreements signify the substitution of contractual arrangements for already established employer-administered or union-administered benefit plans, many of them are new; some of the latter have been negotiated in lieu of wage increases which could not be obtained under the wartime wage stabilization program."

Group health insurance programs have been available in some companies for some time, but they were usually administered by the employer and could be altered or discontinued at the will of the company. It has been claimed that many were started merely to win employee loyalty and discourage union organization.[2] The motives for the establishment of these plans were continually under suspicion and as a result organized labor had never whole-heartedly endorsed them.

With the advent, however, of union participation in the plans to the extent of their inclusion in the union agreement, the attitude of labor on this score has changed considerably, and today we find health benefit programs, although for the greater part paid for entirely by industry, jointly administered by management and labor, or in some instances administered entirely by the union.

Examples are the union agreements initiated by the Amalgamated Clothing Workers and the United Retail, Whole-

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 13, 1946.

sale and Department Store Employees Unions which call upon the employers to pay a percentage of the payroll into the fund which, in turn, is administered jointly by the employers and the unions. The International Ladies Garment Workers Union and the Hat, Cap and Millinery Workers Unions administer the fund made available by a gross payroll tax contributed by the employers. The Textile Workers, CIO, fund is employer financed, and administered by insurance companies. The National Bituminous Wage Agreement, effective during the period of government operation of mines, provides a health and welfare program, the welfare and retirement fund being supported exclusively by the operators and managed by three trustees, one appointed by the Coal Mines Administrator, one appointed by the President of the United Mine Workers, and the third chosen by the other two. Furthermore, the trustees administer the medical and hospital fund accumulated from wage deductions authorized by the union.

It is true that in general greater emphasis is being placed on group health insurance and sickness benefit plans in collective bargaining than on basic industrial hygiene factors and principles. One of the most comprehensive series of clauses pertaining to health, safety, and medical care is that of the United Mine Workers, which clearly places industrial hygiene in as important a category as issues of wages and union security. In addition to their health and welfare program referred to above, "the Coal Mines Administrator undertakes to have made a comprehensive survey and study of the hospital and medical facilities, medical treatment, sanitary and housing conditions in the coal mining areas. The purpose of this survey will be to determine the character and scope of improvements which should be made to provide the mine workers of the nation with medical, housing, and sanitary facilities conforming to recognized American standards." [3] Thus, the supervision of industrial hazards takes its proper place in the consideration of the health and welfare of the worker.

The rapid movement of demands by unions for health and welfare service from employers does not, in the true sense, actually involve industrial hygiene, according to Dr. Leo Price, Director of the Union Health Center, who stated: "As far as unions are concerned, emphasis has been shifted from industrial hygiene to social security and health service for workers. All the union contracts in the garment industry which have secured a payroll tax levy stipulate it should be spent for vacation benefits and health services such as medical care, sickness and hospitalization benefits and death benefits." [4]

Nevertheless, there is ample evidence of the increasing interest on the part of labor to include various industrial hygiene provisions in union agreements. A study [5] of union agreements in effect twenty years ago reveals various provisions relative to the safety and comfort of employees already existent at that time. Clauses called for suitable fire protection, the observation of sanitary codes, satisfactory sanitary arrangements, adequate dressing rooms, lockers, wash rooms, toilets, and cold drinking water. Some clauses called for cleanliness and sanitary conditions with sufficient heat, light, and ventilation. Suction devices were to be provided for dust-raising machines. The clauses, however, were all very meager and were but the beginning of more comprehensive clauses in later years.

The International Union of United Automobile, Aircraft and Agricultural Implement Workers of America (UAW-CIO) has issued a publication [6] containing sample clauses recommended for all local unions by the International Executive Board which are quite comprehensive. The recommendations call

for a health and safety committee consisting of company and union representatives. The duties of this committee are outlined specifically and if followed should make for a comprehensive industrial hygiene program. Furthermore, the agreement outlines the company's industrial hygiene responsibility to the effect primarily that the company shall "maintain sanitary, safe and healthful working conditions in the plant, to equip all hazardous machinery with effective safety devices, to maintain precautions against exposure which may cause occupational diseases or other symptoms, and to furnish and maintain without cost to the employee whatever equipment and clothing may be needed by them for the safe, healthful, and protective performance of their jobs." Provisions are made for the reporting of all industrial injuries, diseases, and absences due to illness to the health and safety committee, for the maintenance of the necessary medical facilities for the treatment of injured employees and the limitations to be placed on the services to be rendered by first aid men and nurses. The agreement specifies that physical examinations shall be made and the results be held confidential, and that such physical examinations "shall be used solely for the purpose of proper placement," and that any changes in the employee's position that may result from physical examination shall be referred to the health and safety committee for investigation.

The above requirements seem to be reasonable and logical. With mutual understanding of the importance of maintaining healthful working conditions for the protection and health of the worker, there is no question but that proper and adequate results can be obtained. At least it puts the company on notice that labor expects the conditions that industrial hygienists have been pleading for these many years. Ever so many surveys indicate the relative infrequency of good industrial hygiene services. If those companies in which there are union agreements will write into the contract the industrial hygiene clauses that are recommended and the companies as well as the employees carry out the provisions, one of the greatest steps forward in industrial hygiene will have been taken.

Unfortunately the local union agreements are not generally as comprehensive as those recommended above, but there are sufficient numbers to indicate the development of an industrial hygiene consciousness on the part of management and labor.

Several union agreements that have been reviewed still make reference merely to adherence to legal requirements and thus dismiss the subject. Another type of agreement emphasizes cleanliness of toilets and wash rooms, while others state only that the company agrees to provide healthful working conditions. An aircraft company includes in its union agreement clauses on physical examinations, plant sanitation, exhaust ventilation, first aid, health and safety committees. In a shipbuilding agreement the industrial hygiene considerations are embodied in one clause, as follows:

> "All toilets and washrooms shall be kept in a clean and sanitary condition, properly heated and ventilated, and suitable quarters with heat shall be provided for men to change clothes and eat their lunch. There shall be facilities for drying clothing; and all staging, walks, ladders, gang planks, and safety appliances shall be constructed in a safe and proper manner by competent mechanics. Proper lighting and ventilation shall be provided for all enclosed working spaces. The employer shall furnish suitable guards around welders for the protection of workmen's eyes. In case of spray painting, employer shall provide proper protection against fumes caused by paint spray. Prompt ambulance service and first aid to injured workmen shall be provided on all shifts, and a safety man shall be employed and made responsible for the

proper enforcement of safety rules. Suitable lockers, washrooms, and drinking water shall be furnished by the employer. There shall be no doctor's physical examination nor age limit, except as required by law. Unless required by law, no employee shall be compelled to pay hospital or insurance fees in the course of employment or as a condition to secure employment."

The safety director of a company, which has the following industrial hygiene clauses in its agreement with the union, feels that the reference to union recognition of the employees' duty to coöperate with the company in its safety and health program is "a great step forward in union and management coöperation in the health and safety of workers in an industrial plant":

"The Company recognizes its obligation under the law of the Local, State and Federal Governments, with reference to the health and safety of its employees, and shall continue to comply therewith. In the event such laws are inadequate to insure proper protection to its employees, the Company agrees to make every reasonable effort to eliminate all unsafe or unhealthy conditions. The Union recognizes the duty of the employees to cooperate with the Company in its safety and health program when approved by the Union."

"A joint safety committee composed of equal representatives of the Company and the Union shall investigate all accidents and take all necessary steps to prevent accidents."

"The Company will furnish all necessary equipment such as special gloves for handling hot metal, goggles, respirators and other such articles required by safety codes."

"All lavatory and wash room facilities will be kept clean and sanitary in addition to being provided with soap and adequate lockers."

The following agreement is a splendid example of effective industrial hygiene clauses which both labor and management have found to be highly beneficial, for the joint Safety Committee is interested in all phases of conditions relative to the working conditions, safety standards, and other conditions affecting the employees' health and well-being; furthermore, the committee is well versed in the safety standards prescribed by the Department of Labor and Industries for the State, and is continually striving for the betterment of the safety conditions and welfare of the employees:

Physical Examinations—

"Every applicant for employment must pass a physical examination. If, by such examination the applicant is rejected for employment, he will be furnished with the doctor's report upon request. The applicant shall then have the privilege of having an examination by a qualified physician of his own choosing. If the two reports are contradictory, the Union may then take the matter through the regular grievance channels. The cost of examination by his own physician shall be paid by the applicant.

Plant Safety Committee—

"It is the desire of both parties to this agreement to maintain high standards of safety in the plants of the company in order to eliminate as far as possible industrial accidents and illnesses.

"Plant Safety Committees shall be appointed from employees at each of the Company's plants not exceding four representing the Union and four representing the Company. The chairmanship of these committees shall be rotated between the Union and the Company members each quarter. The secretary shall be chosen from the opposite group to the chairman and shall keep minutes of all meetings.

"The duty of the Plant Safety Committees will be to see that all applicable state and municipal safety and sanitary regulations are complied with as well as to make recommendations for the maintenance of proper standards. These committees shall receive and investigate complaints regarding unsafe and unsanitary working conditions.

"The Company shall have available at all times in each shop, a supply of safety report forms, made up in quadruplicate for the use of shop committeemen and foremen to report any needed correction in the shop relative to safety conditions. One copy of this report will be sent to the chairman of the safety committee, one copy to the President of the Union, and one copy to the Company Safety Supervisor. The original copy of the report will remain in the shop files, which shall be available at all times to the shop committee. The Company safety supervisor will keep the above named persons informed in writing of

the progress, disposition and adjustment of each such safety report.

"Proper and modern safety devices shall be provided for all employees working on unsafe and hazardous work, such devices to be furnished by the Company, and it shall be mandatory for employees to use same.

First Aid—

"The Company at all times shall maintain on all shifts, in all plants, sufficient registered nurses and emergency first aid stations to care for employees in case of accidental injuries.

"The Company shall provide ambulance service for all shifts in all plants.

Sanitation—

"All toilets and wash rooms shall be kept in a clean and sanitary condition and suitable quarters with heat shall be provided for men to change clothes and their lunch. There shall be facilities for drying clothes, and all staging, walks, ladders, gang planks and safety appliances shall be constructed in a safe and proper manner by competent mechanics. Proper ventilation shall be provided and welders shall have guards around their work to protect workmen's eyes. Arrangements must be made to give prompt ambulance service and first-aid to injured workmen, and a safety man shall be provided on all shifts, if necessary, and made responsible for the proper enforcement of safety rules. The Business Representatives of the various crafts shall have access to the shops and yards at all times by applying for permission through the office, provided they do not interfere with or cause workmen to neglect their work. Shower baths shall be installed where tank and boiler cleaning work is done.

Control of Hazards—

"All equipment and processes that emit or create harmful dusts, fumes, vapors or gases in quantities, that create harmful exposure to employees exposed thereto and where the prevention, elimination, or control of said hazards by means of general ventilation alone are inadequate to furnish the required protection, shall be connected to an exhaust system for the removal of said hazards as far as practicable at their point of origin."

An industrialist in a personal communication recently stated: "In contract negotiations in recent years, the matter of so-called industrial hygiene or safety clauses has been discussed. In view of the health maintenance program and the extensive safety program in existence in all our plants, and the record of performance which has been achieved as a result of these programs, our position in this respect is different from that which might be obtained in other industrial enterprises not having the same performance record.

"In the matter of industrial hygiene or accident prevention work, management, in the final analysis, is charged with the responsibility for the conditions which exist in an industrial enterprise. Accordingly, we believe that since the responsibility rests with management, the execution of such responsibility must also rest with management. On the other hand, this does not mean that we discourage interest on the part of our employees in making suggestions or taking an active part in making our plants safer and healthier places in which to work. In fact, the Company's Suggestion Plan provides a means whereby employees may receive financial reward for making suggestions for the improvement of safe working conditions."

Industrial medical services, including health and safety activities, have been for the greater part the sole responsibility of management until the last few years. There is fragmentary evidence of references to health and safety in union agreements in effect twenty years ago, but within the last two decades organized labor has taken an increased interest in industrial health services and if this movement takes on the anticipated impetus, management will be compelled to pay more attention to the environment in which the employee works. Everything points to a more consummate effort on the part of management to introduce and maintain the most modern medical services that are attainable.

Whether this will come as a result of the insistence of labor to include industrial hygiene clauses in the union agreement, whether it will come about by management's voluntary contribution, or whether it will result from

mutual coöperation between management and labor, is of relative significance, but that industrial management operations for effective production demand some such consideration is the crux of the development of adequate industrial medical services at all times in all industries.

Above all, industrial hygienists everywhere have a golden opportunity to enhance their field by enlisting the support of labor, and to this end the Union Agreement can be an effective instrument.

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Postcensal Population Data for Cities*

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SINCE 1940 there have been spectacular rises in the numbers of marriages and births in the United States. Further gains have been made in death control, with unanticipated special progress in reducing the toll of certain diseases. Fifteen million men and women entered the armed forces, of whom only 1,300,000 now remain there. The growth of cities was affected not only by these factors, but also by a record amount of internal migration, on the part of both civilians and troops.

Amid all these changes, the vital statistician needs postcensal population figures more than ever. He wants to compute the birth, death, and marriage rates for his city during the war and post-war years. The public health administrator is interested in the size of the population he must serve and in its racial, personal, social, and economic characteristics. He wants to know what effects of the war upon urban populations are relatively permanent and to what extent pre-war levels and trends are being reëstablished.

You are probably keenly aware that the Bureau of the Census does not have annual postcensal population estimates for all cities, even those above a certain size. It is unlikely to have such estimates in the near future. On the positive side, however, it should be said that the demographic changes of the period since 1940 are far better chronicled than those of any previous period in American history except for the census years themselves. This is particularly true on the national level; but an unprecedentedly large amount of data have also been collected and published for states, counties, and cities. These gains are partly overshadowed by the very magnitude of the changes that have occurred and by the rapid growth in the public's demand for statistics.

Before summarizing the population data now available for cities, I should like to discuss briefly the possible population figures for an area. In a decennial federal census, the population shown for a state or city is essentially the *de jure* population, that is, the number of people whose usual residence is in the area. Members of the armed forces are counted where they are stationed. During the war there was an understandable desire on the part of a city to have its former residents absent in the armed forces counted as part of its population. For several reasons, such a procedure was impracticable. No one knew how many men inducted from the city had families there to report them. The total number of men entering the armed forces included some who had died or had already been discharged and settled elsewhere; some still in the service would die in the service or settle elsewhere upon their discharge. Therefore, the Census Bureau never counted such persons in local censuses or included them in estimates.

* Presented before the Vital Statistics Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 14, 1946.

It was possible to include troops stationed in an area in the censuses and some of the estimates. The sum of the troops and the resident civilians does not constitute, however, the *de facto* population of the area. On the contrary, this sum is comparable with the decennial census figures, since civilians temporarily absent were included and those only visiting in the area were excluded.

Realistically, however, it was recognized that the troops stationed in a city were a very transitory part of its population. In many ways they were not the responsibility of the city government. Therefore, whenever security regulations permitted, they were shown separately. At other times, only the civilian population was enumerated or estimated. In computing birth rates for states, the National Office of Vital Statistics has used the resident civilian population as a base. In computing death rates, it has used the civilian population plus the troops stationed in the area.

At the request and expense of local governments, the Census Bureau has conducted about 250 special censuses since 1940. Most have been of cities, but others covered counties, minor civil divisions, or new annexations to a city. These censuses represent complete counts of the military and civilian populations in the area. The Bureau provides the supervisor (for whose services it is remunerated), schedules, and procedural instructions. It tabulates the data, certifies the figures as official, and publishes the results.[1]

Most local governments request only a cross-classification of their population by sex and race, but the larger ones usually are also interested in the distribution by age. If the city is tracted, the data are tabulated by census tracts. The number of occupied dwelling units, which is equivalent to the number of private households, is almost always obtained. If the sponsoring government desires, the schedule will cover additional characteristics of population and housing.

Most of the cities that have sponsored special censuses have been in California, but there have been a fair number in other parts of the country. The larger places canvassed include Berkeley, Long Beach, Los Angeles, Oakland, Sacramento, San Diego, and San Francisco, Calif.; Beaumont and Port Arthur, Tex.; and Wilmington, N. C.

In 1944 the President's Commission on Congested Production Areas asked the Bureau to conduct sample censuses in the more important such areas. Those enumerated were: The Puget Sound, Portland-Vancouver, San Francisco Bay, Los Angeles, and San Diego areas on the West Coast; the Detroit-Willow Run and Muskegon areas in the Middle West; and the Hampton Roads, Charleston, S. C., and Mobile areas in the South. The total population of each area was obtained with a coefficient of variation of less than 1 per cent, i. e., 2 out of 3 times an estimated value should fall within 1 per cent of the complete count. Estimates of the total and civilian populations were published for 22 cities in these areas.[2] In addition to these resident populations, the population actually present on the census date (the *de facto* population) was shown.

Published data from these sample censuses covered a wide variety of characteristics. These included sex, race, age, marital status, and relationship to head of household; number, origin, and characteristics of in-migrants; employment status; and characteristics of housing.

Chiefly on the basis of the number of registrations for ration books, estimates were made of the civilian population of counties as of May, 1942; March, 1943; and November, 1943.[3] By

now, station strength in a particular county on these dates is obtainable from the War and Navy Departments. This military population may be added if the total population is desired. Only a few cities coincide with these counties, it is true; but in the case of many of the larger cities, the county population provides a useful ceiling in the preparation of an estimate. For the last date, November, 1943, the estimated age and sex distribution was also published for 39 areas of intense war activity.[4]

Beginning in 1942, the Census Bureau, in coöperation with the National Housing Administration, has conducted numerous housing surveys in urban areas, on a sample basis. Of these, 250 have estimated the number of occupied and vacant private dwelling units in the city.[5] Tenure and persons per room are reported for the occupied dwelling units and habitability for the vacant ones. Similar studies have been conducted in a number of large cities by the Bureau of Labor Statistics. Urban surveys have been made to determine the housing intentions of veterans.[6] To date press releases for 113 areas have been published. Among other facts reported is whether the veteran lived in the area at the time of his entry into the armed forces, an item which indicates the extent of in-migration of veterans.

It may be of interest that wartime migrants, in general, have not returned in large numbers since V-J Day to their old homes. The centers of war production are tending to hold on to their gains, according to several surveys made by the Census Bureau. Furthermore, the volume of internal migration has continued to be large in the first year of peace. Many veterans are settling in new homes, and their destinations are similar to those chosen by civilian migrants during the war.

There are prospects for a fair number of additional population estimates between now and 1950. In October, November, and December, 1946, sample surveys of the nature of the Census Bureau's *Monthly Report on the Labor Force* were taken in a number of local areas. Twenty-five cities and 8 metropolitan districts were covered. Although these surveys were designed primarily to obtain facts about the labor force, the total civilian population was also secured as a by-product. The sample was designed to secure such estimates with a coefficient of variation due to sampling error of 5 per cent.

In April, 1947, an expanded national survey of the labor force, population, and housing was undertaken. Special surveys were also taken in each of 35 metropolitan districts. Three releases have been published for each district: one on population, one on the labor force, and one on housing.[7] An estimate of the population of each metropolitan district is given in the first release. If funds are available, the rest of the 140 metropolitan districts will be covered during 1948 or 1949. These surveys will be similar to those taken in the fall of 1946 rather than to the April survey. It is hoped that estimates of population for cities may be published eventually on the basis of these sample surveys supplemented by independent contemporary data.

The Bureau would have conducted a national sample survey in October, 1946, had the necessary funds been appropriated by the Congress. In fact, funds for preparatory work on this sample were provided in the fiscal year 1946; and in the special census of Wilmington, N. C., taken in April, 1946, the schedule for a national sample census and some of the procedures were pre-tested. As a result of the mapping, schedule testing, and other preparatory work, the Bureau is prepared promptly to conduct a national sample survey of population once funds are provided.

Such a national sample would permit the publication of estimates with a coefficient of variation of about 1.5 per cent for all states and for all cities above a certain minimum size, say 150,000. The composition of the population of these states and cities would also be shown.

Finally, a word may be said about population censuses conducted by the states. Unfortunately, only a small fraction of the states that performed this function several decades ago do so nowadays. In the forties only Florida, Kansas, Massachusetts, and South Dakota have taken censuses. The coverage is on a complete, rather than a sample basis; and figures are published for all incorporated places. The quality of these enumerations varies, and all make a practice of trying to include persons living in the area at the time of their entry into the armed forces but living outside the area at the time of the census.

Meanwhile, the problem of current estimates of city population remains with us. Aside from the ration book registrations and sample surveys, no important new source of estimates has appeared during the forties. As the foregoing resume of available data indicates, however, one does not always need to go back to 1940 as a base date.

It has been often noted that local series sensitive to economic fluctuations are usually poor indices of population growth.[8] In this class, I should put the number of electric, gas, and water meters; the number of telephone subscribers; newspaper circulation; and bank clearings. Early in the war, these series often ran ahead of population growth because their increases reflected mainly the added prosperity of the inhabitants. Later in the war the reverse was often true, since the in-migrants could not get utilities because of shortages or had to double up with other families. Similarly, statistics on building permits and demolitions, usually of moderate aid in making estimates of families, became of restricted use because shortages have limited the new construction needed to take care of the greater number of families in the city.

Where there is a good city directory, the number of listings of individuals may be used in estimating the adult population. The process is expensive and must be carried out carefully. For instance, suburban residents, wives listed separately as well as with their husbands, and business firms should be eliminated. A well designed sample will cut down the expense and give an estimate of the net listings within a determinable sampling error. The population of school age may be estimated from school enrollment statistics or a school census. All these series should be obtained for the base date as well as the estimate date so that the ratio between the series and the equivalent census age group may be established. Finally, children of preschool age may be estimated from resident births. The parts are added to get the estimate of the total population. Note that the postcensal source used does not have to represent a complete coverage of the age group concerned. It is necessary only that the source bear a fairly constant ratio to the population group or that this ratio vary in a predictable manner.

If a recent city directory is not available, one may use vital statistics and school data alone. The natural increase of the city population is first estimated from resident births and deaths. The school data may be used to gauge net migration. Get the ratio of elementary school enrollment or the local school census to a comparable age group in the 1940 census. Using survival rates derived from an appropriate life table, one may next compute the expected number of survivors from the 1940 census in this age group at the estimate date.*

* The number of children at ages below 5 in the 1940 census should be corrected for underenumeration.

This is the number expected had there been no migration. Using the 1940 ratio of the local school statistic to the federal census age group (or an extrapolated value of the ratio), translate this estimate into the expected school enrollment or school census at the estimate date. The difference between the expected and the actual number is an estimate of the net migration in or out for this age group. The simplest assumption is that the rate of net migration can be applied to the population of all ages. In some cases, other assumptions may be made on the basis of additional evidence. For example, it may seem better to assume that the net migration proportion was 50 per cent greater for the population of all ages.[9]

The number of men taken from the city's population into the armed forces through given dates should be obtainable from local selective service boards. It is possible that data on discharges may also be available locally; if not, a factor based on the nation's experience could be used to estimate net loss to the armed forces. The resulting estimate should be subtracted from the population at the base date as an additional step in getting the civilian population. If the total resident population in the city is desired, add the number of troops stationed there at the given postcensal date.

I have given above rough outlines of two types of methods of estimation. These outlines indicate the general approach and are not intended to serve as detailed directions for making a particular estimate. The complete methods would require several pages and even then would not take into account unique problems that might arise in particular cities.

The best population estimates for cities will not be obtained by applying a rigid formula to all cases. Local statisticians are in the best position to investigate the peculiarities in the symptomatic data available for their cities. Some cities have sources that do not exist in others. The Bureau of the Census is now struggling with estimates of state population for July 1, 1947. At present it does not have the facilities to tackle the problem for cities. We should be happy, however, to correspond or consult with statisticians who are making serious attempts to produce estimates for their cities. Such discussions of investigation and experimentation should prove of mutual benefit in uncovering new sources of estimates and in improving methodology.

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Women's Clubs Support Cancer and Heart Programs

The Business and Professional Women's Clubs of New York State, at their 28th Annual Convention in May, adopted the following resolutions submitted by their Health Committee Chairman, Sue Thompson Gould, M.D., then Commissioner of the Columbia County Department of Health:

1. That each club stimulate the promotion of a Cancer Detection Clinic through its county medical society if one has not already been established.

2. That the Business and Professional Women's Clubs of New York State, Inc., through its individual clubs coöperate actively and lend its support to programs of education, research, and service for Heart Disease.

3. That the Business and Professional Women's Clubs of New York State, Inc., through its individual clubs supports the American Heart Association in its effort to establish a county heart association wherever one has not already been established.

Diagnostic Procedures for Gonococcal Infection

Summary of a Panel Discussion *

STAFF members of three laboratories in Baltimore, Md., engaged in routine isolation of the gonococcus maintained an active exchange of experiences through conferences held throughout the past two years. In the first paper they presented a detailed *critique* based on the chapter "The Gonococcus" in the second edition of *Diagnostic Procedures and Reagents*. The purpose was to reach some general agreement on certain points, to clarify the problems most in need of further investigation, and to suggest important features for possible revision.

The comments can, in general, be grouped under three headings: points on which there is evident need for further study, predominantly those on which the three laboratories found themselves at variance; points which should be amplified by the inclusion of additional or alternative methods, several of which have been published subsequent to publication of the chapter; and points which might be clarified by changes in the language of the text.

Those subjects suggested as needing further study cover practically the entire range of the problem, including: the relative merits of wet and dry swabs, the liquid to be used as a moistening agent for them, the choice of suspension media, methods of inoculating plates, the media to be used, the need for nutritional "supplements" and for inhibiting agents both for repressing growth of extraneous organisms and for counteracting the effect of therapeutic drugs, the relative sensitivity of all suggested modifications of media as studied in large enough series to be statistically significant, methods of transportation including refrigeration and shipment by mail, the establishment of schedules for smears and cultures for determining bacteriological cure, the validity of all methods for this purpose, and the value of the examination of urine, prostatic secretions, and paraurethral and cervical

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-fourth Annual Meeting in Cleveland, Ohio, November 11, 1946.

A Tri-Laboratory Analysis of Diagnostic Procedures and the Presentation of Investigations Pertaining to Them. Justina H. Hill, Sc.D., E. Ellen Nell, and Adelaide H. Mueller, The U. S. Public Health Service and The Johns Hopkins University Venereal Disease Research and Post-Graduate Training Center, Baltimore, Maryland; C. Leroy Ewing, Theodore C. Buck, Jr., Emanuel Kaplan, Sc.D., Rudolpha Clark Turner, and Katherine E. Welsh, The Baltimore City Department of Health; C. A. Perry, Sc.D., Elizabeth Petran, Ph.D., and Patricia Haugh, The Maryland State Department of Health.

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Isolation of Gonococci from Specimens Received in Coagulated-Blood Gelatin Agar. Marion B. Coleman, Division of Laboratories and Research, Albany, New York.

The Oxalate Salt of p-Aminodimethylaniline, An Improved Reagent for the Oxidase Test. Charles M. Carpenter, M.D., Lief G. Suhrland, and Martha Morrison, University of Rochester, Rochester, New York.

A Comparative Study of Media for the Primary Isolation of the Gonococcus. Thomas H. Weller, M.D., Children's Hospital, Boston, Massachusetts.

swabs. Further study of the microscopic smear technic is suggested particularly in respect to the significance and classification of various atypical findings and the standardization of terminology in evaluating and reporting such results.

Alternative or additional methods are suggested for: inoculation procedures, the direct inoculation of plates from the original swab without emulsification and centrifugation, and the inoculation of chocolate broth tubes and agar slants in addition to plates in the case of blood cultures and joint and spinal fluid cultures; the choice of media, permitting the use of several of the newer modifications; the use of "spotting" as well as "flooding" technics in examining plates for oxidase reactions; the choice of carbohydrates for confirmatory tests, especially the possible omission of lactose for such purpose in routine work.

Direct disagreement with the present chapter is expressed in two particulars: the use of poured plates for blood cultures is considered inadvisable, and exception is taken to the statement that continued examination of smears containing extracellular diplococci will *usually* reveal intracellular organisms. It is also suggested that the chapter might be improved by the inclusion of some colored plates and that the section on complement-fixation should be subordinated, since this procedure is not in general use.

Some clarification in the wording of the chapter is suggested, particularly in respect to those portions dealing with the choice of microscopic or cultural methods or their simultaneous use, the classification of smear findings, the interpretation and reporting of the presence and relative number of pus cells, the definition of "false" positive and negative findings, the amount of carbon dioxide present in candle incubation jars, the carbohydrates to be used for confirmation, and the exact wording of reports.

Accompanying this *critique* the same authors submitted a brief resumé of experimental data accumulated during their investigations. Of a total of 183 smears examined in the three laboratories, complete agreement was reached on only 98 smears; in an additional 76 smears two laboratories agreed, while a third was at variance; and on 9 smears each laboratory reported a different finding. Tests of the various plating media were made by having each laboratory prepare the medium which it was routinely using and having these plates inoculated by the same person from the same sulfathiazole resistant case of gonorrhea. Sixteen such cases were evaluated on five different media: Difco with supplement A, Difco with supplement B and 3 per cent ox serum, cysteine chocolate agar, Mueller's medium, and Cohn's medium. Positive cultures ranged from 11 and 10 on the first three media to 8 and 5 on the two last named. When the three laboratories prepared the same medium, Difco with supplement A, only minor differences were noted although of 14 cases tested in this manner positive findings varied from 12 to 10 in the different laboratories. No difference was noted in a similar experiment using three different lots of hemoglobin.

T. C. Buck, Jr., of the Baltimore City Laboratory, studied a series of urine cultures. The first 15 ml. of urine from each patient was plated as soon as possible. In addition, urethral exudate was obtained and cultured within 10 seconds. This material was collected without prostatic massage and after sulfonamide treatment from 346 asymptomatic males. Urethral cultures were positive and urine cultures negative in 28 cases, while urine cultures were positive and urethral cultures negative in 12 cases. An additional 36 cases yielded positive cultures by both methods.

The Hopkins Laboratory suspended 19 strains of the gonococcus in Proteose

peptone No. 3 with 0.5 per cent sodium chloride, pH 7.6, and made subcultures with minimum inocula at intervals of 1, 2, 4, 6, and 18 hours. One strain was lost in 1 hour, 6 additional strains in 4 hours, 5 more in 6 hours, and by the end of 18 hours 15 of the original 19 strains had been lost.

Mr. Buck also tried a new transportation medium of gelatin agar glycerine base supplemented with fresh egg albumin and ox serum or Difco supplement A.* Of 313 specimens examined 237 were positive on direct plating within 10 seconds after obtaining the specimens from the patient, and 185 after holding 26 to 28 hours at room temperature before plating.

The Hopkins Laboratory also experimented with the use of clarase in addition to supplement A in Difco medium in the presence of penicillin. Clarase itself was not inhibitory and its use permitted the recovery of gonococci which otherwise would be inhibited by penicillin. This laboratory also compared 24 hour with 48 hour plate readings on clinical cultures on Difco medium and found, in a series of 54 cases, 22 which were negative on 24 hour and positive on 48 hour incubation. An additional study indicated that phenol red could be substituted for Andrade indicator in fermentation media.

The remainder of the panel discussion was devoted to the presentation and discussion of a series of papers containing the results of recent investigations by other laboratories.

Dr. J. D. Thayer presented excerpts from four papers from the Venereal Disease Research Laboratory of the U. S. Public Health Service.† He first showed comparative results obtained in the primary isolation of the gonococcus using Peizer medium, Difco Bacto proteose No. 3 agar and hemoglobin, Mueller-Hinton medium, and a modification of McLeod's medium. For primary isolation the modified McLeod's medium gave 9 per cent more positive cultures than did Peizer, 17 per cent more than Difco, and 32 per cent more than Mueller. It was also superior in the number of colonies appearing on the plates. Of the countable plates in the series, McLeod's medium averaged 58.8 colonies per plate as compared with 39.6 on Peizer, 37.9 on Difco, and 10.2 on Mueller-Hinton; while on those plates containing too many colonies to make an accurate count, more were graded 4+ with the McLeod medium than with the others. A comparison of inoculating the medium with the swab immediately, i.e., at the patient's bedside, with inoculations after a 3 hour period of storage in broth at room temperature showed the former method to be superior, yielding 96.5 per cent positive plates as compared with 77.2 per cent. Cysteine has been recommended for addition to media to increase the survival of gonococci but experiments showed that it had no such effect. Experiments on delayed incubation of inoculated plates showed that storage of such plates in an atmosphere of 10 per cent carbon dioxide favored the survival of the gonococcus; 96.6 per cent plates so stored were positive as against 71.1 per cent stored in a normal atmosphere. Primary isolation and identification of the gonococcus on

* *Ven. Dis. Inform.*, 28, 1:6 (Jan.), 1947.

† Thayer, J. D., Shubert, J. H., and Bucca, Matthew. The Evaluation of Culture Mediums for the Routine Isolation of the Gonococcus. *Ven. Dis. Inform.*, 28, 3:37 (Mar.), 1947.

Bucca, Matthew A., Thayer, J. D., and Shubert, J. H. Observations on the Direct Oxidase Test as Applied to Gonococcic Colonies Grown in Certain Mediums. *J. Ven. Dis. Inform.*, 28, 3:40 (Mar.), 1947.

Thayer, J. D., Bucca, Matthew A., and Kirby, Ruth A. An Analysis of Weckstein's Rapid Method for the Primary Identification of the Gonococcus. To be published.

Shubert, J. H., Bucca, Matthew A., and Thayer, J. D. A Study of Preinoculation and Preincubation Factors in the Primary Isolation of *Neisseria gonorrhoeae*. To be published.

plates of Peizer medium containing glucose and maltose with neutral red as indicator according to the method reported by Weckstein proved unsatisfactory in the hands of the author since 64 per cent of the plates gave atypical reactions. Finally mention is made of the necessity of neutralizing the oxidase reagent *p*-aminodimethylaniline hydrochloride with sodium carbonate to avoid atypical reactions.

Lenore Peizer presented a series of studies on the efficiency of transportation methods for gonorrheal specimens. The same swab was used to inoculate transportation media and control plates of plasma hemoglobin agar. Control plates were incubated within 6 hours of the collection of the specimens, transportation media after storing at room temperature for 24 hours. All cultures were incubated in 8 to 10 per cent carbon dioxide at 36°C. for a period of 40 hours. Of 257 specimens from females, 62 gonococcus cultures were obtained from control plates and 18 from Hirschberg chocolate gelatin, Nile blue A agar. Of 745 similar specimens, 197 gonococcus cultures were obtained from control plates and 173 from slanted plasma hemoglobin agar in tubes containing 10 per cent carbon dioxide, according to the method of Usher and Stein, the tubes in this series being examined after 24 hour as well as 40 hour incubation periods. Of 1,260 specimens from both males and females, 483 gonococcus cultures were obtained from control plates and 459 from a ¼ inch layer of plasma hemoglobin agar in rectangular bottles as recommended by McClure and Miller.

The effect of delayed incubation with Hirschberg medium was studied on a series of 87 specimens from males with acute gonorrhea. All 87 specimens were positive on control plates incubated within 6 hours, 84 were positive on plates and 18 on Hirschberg medium incubated after 24 hours, 43 were positive on plates and 7 on Hirschberg medium after 48 hours, and 9 were positive on plates and none on Hirschberg medium after 72 hours.

Dr. Nell Hirschberg presented a summary of the present status of methods for the transportation of specimens for gonococcus culture. The literature was briefly reviewed and the following reports were selected as those that have influenced others to try out the methods: Greene in 1938 advocated the use of swabs impregnated with sterile ascitic fluid for making smears, stating that the preliminary incubation of these swabs increased the number of intracellular organisms; Cox in 1942–1943 first advocated a horse blood solution with 1:30,000 gentian violet and later horse serum with 1:800,000 gentian violet; Peizer in 1943 reported the use of plasma hemoglobin cysteine agar and Stein described the use of Peizer's medium in tubes into which carbon dioxide had been introduced; Hirschberg in the same year used 20 per cent chocolate gelatin agar; Porterfield in 1944 reported the use of Bacto proteose No. 3 with hemoglobin and Bacto supplement A; and Higgenbotham in 1944 advocated the use of 0.2 per cent KNO_2 and shipment in thermos jugs with ice or dry ice. All of these investigators reported better results with cultures than with smears and better results with immediate than with delayed platings.

Russell Stein of the New Jersey State Department of Health in July, 1946, found from questionnaires returned from 44 state health department laboratories that 8 such laboratories offered no routine gonococcus culture service, 27 limited their service to local areas close to their laboratories, and that 10 offered a state-wide service with transportation media. Five of these states used Cox's medium, two used Hirschberg, one used McLeod's agar slants, one used horse plasma hemoglobin agar, and one used Buck's medium. Very few

of the directors of these laboratories felt that their methods were efficient but all agreed that transported cultures, no matter how poor, are superior to smears. This report was accompanied by an exhibit of the outfits distributed by the various states for this purpose.

Dr. Hirschberg then reviewed the experience of the North Carolina State Laboratory with the use of transportation media. She pointed out that while better media may be developed in the future, the present medium has been used in the examination of over 3,500 specimens and has yielded a substantial number of positive cultures from cases that were negative by microscopic examination of smears. Yeast extract is a good source of enrichment nutrients but crystal violet inhibits the growth of many strains of gonococci. Nile blue A which is used in Hirschberg medium does not inhibit the gonococcus but probably does not aid very much in holding down contamination. A good laboratory worker near the clinic or physician's office can isolate the gonococcus by direct culture of specimens from female patients three times as frequently as it can be demonstrated by microscopic smear examinations, and approximately twice as frequently in specimens from males. Transported cultures do not give such high ratios because temperature, food supply, drug therapy, local treatment, and the peculiar habits of the organism itself all interfere with the viability of the gonococcus during transportation. A series of duplicate specimens, half of which were incubated immediately, and half transported by auto in sealed jars for an hour before incubation, showed a drop of 15 per cent in the number of positives. Isolations from Negro and white patients did not differ markedly. Classification by purpose of examination showed 26 per cent positives in specimens for diagnosis, 24 per cent in contact specimens, and 20 per cent in treatment control specimens. Of 460 routine smear and culture specimens sent by mail, 26 were positive by both methods, 33 by smear alone, and 54 by culture alone. Because New York State Laboratories, using the same medium prepared at a higher temperature and containing more blood, seemed to be getting better results; some comparative series were run with that medium but the difference seems to be accounted for chiefly by the fact that in New York physicians collected a very much larger percentage of the specimens. Occasional positive findings on one but not the other medium emphasize the fact that the more types of media are used the more positive isolations may be expected. At the present time the North Carolina laboratories are using a medium prepared by the original formula for transportation purposes but are using 10 per cent blood in medium prepared at 80°C. for plating.

Marion B. Coleman presented the experience of the New York State Division of Laboratories and Research with transportation media and methods essentially those of Hirschberg. Over a 27 month period, approximately 1,400 specimens from female patients were examined. Gonococci were isolated from 12.6 per cent and were found by microscopic examination in 7.8 per cent. Of the total number of specimens showing gonococci 20 per cent were missed by the culture method and 50 per cent by the microscopic method. In a relatively small series of 100 specimens from males the findings were in sharp contrast, gonococci being demonstrated in 36 per cent by microscopic examination and in 22 per cent by culture. During the same period a series of 711 triplicate specimens were collected from female patients in a local clinic; one swab was used immediately for direct inoculation of a plate which was incubated within 3 hours; a duplicate swab was stored in Hirschberg medium at room temperature

overnight and plates were inoculated the next day; while the third swab was used to prepare films on slides. Gonococci were isolated from 23.4 per cent and found microscopically in only 9 per cent. Direct plating yielded gonococci in 22.3 per cent and delayed plating in 18.7 per cent. It was concluded that reliance should not be placed on either microscopic or cultural examinations alone; both procedures are desirable.

Martha Morrison, in the absence of Dr. Charles M. Carpenter, presented a report on an improved reagent for the oxidase test. The oxalate salt of *p*-aminodimethylaniline has proved superior to the monohydrochloride salt previously recommended, being more stable and less likely to yield cloudy and highly colored solutions. Six months' storage in amber colored bottles showed no visible change in the dry oxalate salt, whereas the monohydrochloride showed pronounced darkening; 1.0 per cent aqueous solutions have greater clarity and show less precipitation on standing, colorimeter tests indicating that the oxalate solution needed to stand 72 hours in order to give a reading equivalent to the 24 hour reading of the monohydrochloride. A slight disadvantage of the oxalate is that it goes into solution somewhat more slowly, but this can be overcome by gentle heating.

Dr. Thomas H. Weller, the final speaker on the panel, presented a comparative study of media for the primary isolation of the gonococcus.* Cervical and urethral swabbings collected from 815 venereal disease clinic patients served as the test material. Each specimen was suspended in proteose-peptone broth and thoroughly mixed; a drop of the suspension was then placed on plates of each of five media and spread over the surface with a wire loop. A modified Peizer medium, using human red cells and plasma, detected the greatest number of positives, 96 per cent; while Mueller-Hinton media, both freshly prepared and dehydrated (Difco), detected 90 per cent; 74 per cent of the known positives grew on Bacto proteose No. 3 agar with Bacto-hemoglobin and 72 per cent on the same medium with Bacto yeast supplement A. No difference was observed between the freshly prepared and dehydrated Mueller-Hinton media, and the speaker suggested its use in laboratories where limited facilities necessitate the employment of a dehydrated medium.

The discussion was brought to a conclusion with the statement of the panel leader, Dr. Justina Hill, that the morning's discussion had certainly shown how little was known about several aspects of gonococcus culture work and how great was the need for further study.

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* Weller, T. H., and Williams, J. E. Comparative Study of Media for the Primary Isolation of the Gonococcus. *Am. J. Syph. Gonor., & Ven Dis.*, 30, 4:386 (July), 1946.

Vol. 37

American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume 37 November, 1947 Number 11

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THE AMERICAN PUBLIC HEALTH ASSOCIATION

IN climbing a mountain, there are moments when one has surmounted an awkward cliff and pauses for a moment to look back and survey the ground gained as a source of satisfaction and an encouragement for what may be the even greater challenges which lie ahead. Such a moment is the celebration of the 75th anniversary of the American Public Health Association at Atlantic City last month.

The retrospect is of particular interest in this case, since the history of our Association is, in essence, the history of perhaps the most significant social movement of modern times. It was founded at the dawn of a new era, the era in which—for the first time in human history—the life span of the human animal ceased to be a plaything of Lachesis and became a factor largely under the control of the human will; when, in the words of Hermann M. Biggs, it became clear that "within natural limitations, a community can determine its own death rate."

What was the status of "public health" seventy-five years ago? We had local boards of health in a number of our seaboard cities, dating back to the yellow fever epidemics of the last decade of the Eighteenth Century; but their weapons were limited to the crudest and most empirical procedures of sanitation and quarantine. Chadwick's epoch-making report on *The Sanitary Condition of the Laboring Population of Great Britain* had, however, been published in 1842; and the even more far-sighted program of Shattuck (probably the most remarkable single document in the history of public health), his Report on the Sanitary Condition of Massachusetts, in 1850. Studies by Panum on measles (1847), by Snow on cholera (1849), and by Budd on typhoid fever (1859) had laid the foundation for modern scientific epidemiology. The anthrax bacillus had been seen by Davaine in 1850; Pasteur, between 1857 and 1865 had established the germ theory of fermentation and the doctrine of biogenesis, and Lister in 1867 had introduced antiseptic surgery. Massachusetts had established the first state board of health in 1869; and California and Virginia had followed suit in 1871, the same year in which the Local Government Board began its work in England. The foundation had thus been well and truly laid; but the construction of the building had not yet been begun. The discovery of controlled immunization (except in the case of smallpox) had yet to wait for the studies of Pasteur in

1880–1881; the discovery of the tubercle bacillus was to come only in 1882, and that of the diphtheria bacillus in 1884.

It was then a bold and creative vision which animated nine physicians[1] and one architect[2] to meet in New York City on April 18, 1872, and decide on the establishment of a national sanitary association. At this meeting a committee on permanent organization was appointed under the chairmanship of Stephen Smith; and on September 12 of the same year the American Public Health Association was formally organized at Long Branch, N. J., a constitution was adopted and Stephen Smith named as our first president. The objects of the Association were: "the advancement of sanitary science and the promotion of organizations and measures for the practical application of public hygiene"; and members (elected by two-thirds of the members present at an annual meeting, after recommendation by a majority of the Executive Committee) must be "selected with special reference to their acknowledged interest in, or devotion to, sanitary studies and allied sciences and to the practical application of the same."

It is of interest to note that the *New York Times* of September 17, 1872, in a discussion of "Minor Topics" on its editorial page made the following pertinent comment:

> "We trust the American Health Association will prove worthy of its title, and of the formidable list of committees to which the leading subjects which it undertakes to investigate have been referred. There is a vast unoccupied field awaiting the action of such a society, and the many eminent names which appear among its members must secure, under proper organization, the obtaining of some very valuable results. Sanitary science, considered either in its statistical or other aspects, is but in its infancy among us, and there is certainly nothing more systematically neglected in our great cities than the most rudimentary and obvious of sanitary laws. We hope that the Association will direct its attention to the educating of public sentiment as well as to the furnishing of scientific data."

The first two meetings of the Association for the formal presentation of papers were held in the spring and fall of 1873; and the quality of these contributions[3] was extraordinarily high. Stephen Smith made a reasoned and impassioned plea for increased longevity. He said, in relation to the vital statistics of the time, "Of the children born, what vast percentages never see the anniversary of their birth? What other large percentage dies within five years? How few, comparatively, reach the age of ten? At twenty the generation has dwindled to an insignificant minority, and at thirty-three to forty-five it disappears altogether."

Against this picture—not very much exaggerated so far as our great cities were concerned—he sets the century mark as a normal span for human life.

Francis A. Walker, then Superintendent of the Census, gave an extraordinary analysis of the relation of race and nationality to mortality in the United States which could well be used as a background by present-day students in this field. F. A. P. Barnard, President of "Columbia College" presented a thoughtful and open-minded analysis of current evidence in regard to the new germ theory of disease. Andrew D. White, President of Cornell, opened up the topic of "Sanitary Science in Its Relation to Public Instruction." Carl Pfeiffer discussed the "health principles of architecture." Austin Flint described the epidemic at North Boston, N. Y., in 1843, clearly traced to a polluted well, the first convincing example of this phenomenon upon our continent. Smallpox, cholera, and yellow fever, of course, received much attention. In the field of practical health administration, Elisha Harris presented a very sound review of the principles of "state

and local sanitary organization," and John M. Toner anticipated the work of the Committee on Administrative Practice with data obtained by a questionnaire on the administrative set-up and vital statistics procedures (including some salary scales) of 137 state and local boards of health in the United States. This subject was set up as a continuing activity of the Association through the presentation in 1875 of the report of a Committee on the Plan for a "Systematic Sanitary Survey of the United States," which included a schedule of inquiries running to more than 500 specific questions. At the same session[4] Dorman B. Eaton, whose framing of the health laws of New York City is the basis of all our public health powers of today, presented an analysis of the political principles of health legislation which is still vital and inspiring in 1947.

The history of the Association (and of public health in general) from 1872 to 1921 has been admirably reviewed in a volume edited by M. P. Ravenel[5]; and in 1972 a second volume of this history should be compiled. Here, we can mark only the high points of the story. During the first quarter-century of the life of the Association, the annual meetings and the annually printed "Reports and Papers" essentially constituted its life history; and these volumes form fascinating reading. Eloquent laudations of Hygeia were not lacking; and we must not be surprised to find discussions of the influence of forests on health and proposals for the disinfection of sewers by ozone. We find also sound judgment and broad vision, which included such urgent present-day problems as housing (Stephen Smith called the home "the unit of sanitary administration"), industrial health, railway sanitation, and the like.

One cannot take one of these old volumes from the shelf without finding passages which are prescient and inspiring; and many a valuable doctoral dissertation could be based on a serious analysis of the trends of thought which they represent.

The gift by Henry Lomb of Rochester in 1884 of $2,000 to be awarded for essays on certain specified topics (which included housing and nutrition, school hygiene and occupational hygiene) produced a crop of particularly significant papers in 1885.

By 1890, the membership of the Association had grown to over 500 and it was rated as "the largest and most influential organization in the world in shaping public health opinions." Most significant of all was the fact that this Association, conceived in New York City, and made national in scope in New Jersey, became international with the invitation to Canadian health workers to join in 1884. In 1892, Mexican health authorities took similar action and in 1902 Cuba followed suit. Our Association represents the public health movement not only in the United States but in the whole of the North American continent. Four flags are displayed on our platform; and representatives of Canada, Cuba, and Mexico have played a leading rôle in our program and in our organization as a whole.

Perhaps the most important step in the history of the Association (after the foundation of the Association itself in 1872) was the creation of its first specialized section, the Laboratory Section, in 1899. A series of preliminary conferences and committees initiated by Wyatt Johnston between 1894 and 1899 led to this happy result. Nearly one hundred members enrolled in the Section at once, of whom about half were new members of the Association. We are now, in the history of the Association, well within the limits of personal memory; and the writer can clearly recall the extraordinary influence of the Laboratory Section in bringing the methods and the attitudes of exact science into its deliberations.

This Section was the vital growing-point of the A.P.H.A. in the first decade of the present century. The precedent thus set was followed in other fields at the end of this demonstration period and thereafter, as the chronological list of our present Sections indicates:

1899	Laboratory Section	1921	Maternal and Child Health
1908	Health Officers	1922	Public Health Education
1908	Vital Statistics	1923	Public Health Nursing
1911	Engineering	1929	Epidemiology
1914	Industrial Hygiene	1942	School Health
1917	Food and Nutrition	1943	Dental Health

Thus, when the Association held its Fifty Year Jubilee in 1921, Stephen Smith who—at the age of 99—gave an address, could look back with pride on the edifice whose cornerstone he had laid. Already we had sections representing expertness in seven different specialized fields of public health (with five more to come). Increasingly these sections have become the life blood of the Association. The program of our annual meeting is a section program, with a dozen addresses at general and special sessions as frosting on the cake. The activities of the members of these sections furnish the advancing knowledge on which our program is based; and it is of incalculable importance that through the Association itself they are united in a profession conscious of its singleness of purpose and devoted to the general cause of public health.

In connection with the development of all the activities of the Association its regular printed publications have played an important rôle. For the first forty years of its history it published the annual volumes of *Reports and Papers*, to which reference had been made in a preceding paragraph. Volumes I to XXXIII of this series covered the annual meetings from 1873 to 1907. Volumes XXXIV and XXXV (1908 and 1909) were also printed in the *American Journal of Public Hygiene*. This was a publication with its own distinguished history, having been founded in 1890 as the *Journal of the Massachusetts Association of Boards of Health*. This *Journal* became the *American Journal of Public Hygiene* in 1904; and in 1908 became also the official organ of the American Public Health Association Laboratory Section. In 1911, its name was changed to the *American Journal of Public Health* and this *Journal* has since superseded the *Reports and Papers* which were no longer published after 1912. B. R. Rickards, Livingston Farrand (1912), S. M. Gunn (1914), A. W. Hedrich (1918), M .P. Ravenel (1924), and H. S. Mustard (1941) have successively guided the fortunes of the *Journal*, and a very special debt is due to Ravenel for his 17 years of devoted editorship.[5] The names of Henry F. Vaughan and Homer N. Calver must be mentioned appreciatively in connection with the *Journal*. They served on a committee appointed by the Executive Board in 1923 to edit the *Journal* with Dr. Vaughan as Chairman.

In early years the office of the Association and the editorship of the *Journal* were identified in the same person (Rickards, Gunn, Hedrich). It was only in 1921 that the offices of the Association were moved to New York City in proximity to the other associations which made up the National Health Council; and only in 1923 that a full-time General Secretary without major editorial responsibility was appointed (H. N. Calver). After a brief interim, R. M. Atwater was appointed Executive Secretary in 1935, and for 12 years he has given us leadership so wise and so courageous, so human, so patient, and so farseeing that the recognition which he received at Atlantic City last month falls far short of his

desserts. The Association has been fortunate in having many devoted workers on its staff over the years; among them at the present time are five who have each given twelve years or more of top-grade service—Mrs. W. R. Walsh, whose efficiency and charm are central in all headquarters affairs, Miss Jeanne Bickel as accountant, Miss Edith Boyd as Associate Secretary of the Committee on Administrative Practice, Mrs. Augusta Jay as Editorial Associate, and Miss Elsie Siemer as Membership Secretary.

From a purely administrative standpoint, the year 1922 will always be memorable on account of the new Constitution then adopted. This document gave the Association a method of electing its Governing Council which is admirable and—so far as we are aware—unique. The make-up of this Council which includes three classes, officers of the Sections, representatives of local branches, and members-at-large elected by written ballot at the annual meeting, insures the broadest and most responsible representation of all important elements; and is absolutely fool-proof against any form of political manipulation. The second important provision of this Constitution was the creation of Fellowship grade which leaves the educational opportunities of the Association open to all who are interested in public health but maintains its direction in the hands of qualified professional experts. Under this plan the Association has shown phenomenal growth, from less than 3,000 members in 1923 to 11,382 members in October, 1947. Of these, 1,792 were Fellows. In the same period, the budget of the Association rose from less than $100,000 to approximately $350,000.

Development at the periphery has been equally rapid. We have now 27 local affiliated state (or regional) societies (including Cuba and Puerto Rico). In 1928 the Western Branch was established to hold regional meetings, representing wider areas at a distance from the nearest Association membership; and a similar Southern Branch was formed in 1932. In 1943 an annual tour of speakers, representing the Association, to address a series of special meetings in the Western States was inaugurated and has been continued with notable success.

To turn now from problems of organization to concrete achievement, we may set in the first place, historically, the development of standard procedures in the laboratory field. One of the first steps taken by the newly-formed Laboratory Section at the beginning of the century was the development of sound and uniform procedures for the examination of water and milk. The first edition of *Standard Methods for the Examination of Water and Sewage* appeared in 1905, preceded by six reports; that on the examination of dairy products, in 1910. It happens that in the present year (1947) both of these important committees have completed the Ninth Editions of their standard procedures.[6] The value of these reports in developing sound scientific knowledge and securing uniformity of official practice has been simply incalculable and their influence has been world-wide.

The importance of activities of this type was so evident that, in 1930, an overall Committee on Research and Standards was set up as one of the permanent Standing Committees of the Association under the successive chairmanships of Abel Wolman, L. R. Thompson, K. F. Maxcy, and Thomas Francis. An exhaustive monograph, *Diagnostic Procedures and Reagents*, first issued in 1941, is one of the most important recent contributions along this line.

In the area of epidemiology a similarly significant achievement has been the preparation (under the inspired leadership of Haven Emerson) of a series of reports on the *Control of Communicable Diseases*. These reports (1917, 1926, 1935, 1940, 1945) have given us a tabulation of the most important known facts as to the etiology of 72 different communicable diseases, with clear indication of

the administrative methods of recognition, reporting, isolation, and quarantine necessary for their control. These procedures are rapidly being adopted by our various states. The current report was translated into Arabic, French, Italian, Portuguese and Spanish under the Office of War Information. It has been considered for official adoption by China, Canada, the United Kingdom, and various Pan-American Republics.[7]

The Vital Statistics Section has rendered similar—if less dramatic—service in promoting soundness and uniformity of statistical procedures in the field of public health. Its reports have been accepted as authoritative in this country and have had an important influence on the preparation of standard tables of mortality and morbidity on an international scale.

The establishment of the Committee on Administrative Practice in 1920, (made a permanent Standing Committee in 1926) may perhaps be considered to mark a third significant stage in the development of the American Public Health Association. During the Nineteenth Century, as we have seen, its services were rendered mainly through the rather general stimulation of its annual meetings. The establishment of sections with their reports on standard methods and the development of the *Journal* ushered in a phase in which invaluable contributions were made in the evaluation of sound procedures in the diverse special fields of public health. The C.A.P. initiated a vigorous revival of activities concerned with the balance and administrative efficiency of the public health program as a whole, such as Harris and Billings had visualized in the 1870's.

The inspiration of this committee was the pioneer work of C. V. Chapin, who had for years emphasized the responsibility of the health officer for getting maximum results from each health dollar and who published the first comprehensive survey of the work of our state health departments in 1915. The committee has operated under the successive chairmanships of C.-E. A. Winslow (1920–1935), E. L. Bishop (1936–1941), Henry F. Vaughan (1942–1943), and W. L. Halverson (1944). Watson S. Rankin was its first full-time Field Secretary (1923–1925) and W. Frank Walker (1925–1931) its second, each making outstanding contributions. The services of Carl E. Buck as Field Director for 16 years has been of supreme value.[8]

The five major objectives of the C.A.P. have been stated succinctly as follows:

1. Secure authentic information as to the actual practice of American communities in the field of health organization.
2. Utilize the information in the form of a typical community health program which might be set up as a norm or as a general guide to be used by any community which aspires to provide adequate health protection for its citizens.
3. Devise a method by which the health officer may appraise the results obtained by his program.
4. Make results of surveys, standards of administrative practice, and appraisal procedures directly available to health officers.
5. Secure popular support for public health programs by using the appraisal scheme to arouse local interest in health achievement.

Its first step was to prepare—on the basis of preliminary surveys of nearly 200 cities—an appraisal form for the objective recording (so far as possible in quantitative terms) of the actual performance of a given community; and the results of this study were crystallized in the volume prepared by I. V. Hiscock on *Community Health Organization*. In 1929, the committee began active stimulation of sound administrative practice through the Health Conservation Contest and the

National Health Honor Roll. In 1943, this effective promotional device had fulfilled its purpose and the committee replaced it by the application of Health Practice Studies as a basis for a National Reporting Area. The competitive element is thus subordinated, and a basis laid for continuing uniform comparative recording of actual results obtained, carried out through the medium of the state health administrations. Louis I. Dublin has stated "I have no hesitation whatever in saying that the appraisal methods developed by the committee have truly revolutionized public health practice in the United States and in some other countries as well."

One of the most important revelations of the committee's studies was the deplorable lack of organized health services in the rural areas of the United States and Canada. In 1942 the Association adopted a resolution demanding complete coverage with full-time health service for both countries; and a subcommittee on Local Health Units was appointed (under the chairmanship of Haven Emerson). In 1945 a bold and creative report was published on *Local Health Units for the Nation*. The committee has prepared a detailed outline showing how the entire United States could be covered by 1,200 local administrative units, each under the direction of a full-time trained medical health officer assisted by the necessary sanitary, nursing, and other personnel. The program proposed is being actively promoted by institutes in various strategic areas; and the progress made in many states is such as to encourage the hope that the ideals set forth should be within our grasp in the next decade.

Another most fruitful new avenue of usefulness was opened up in 1932 by the establishment of the Committee on Professional Education, as one of the three major Standing Committees of the Association concerned with constructive service in the public health field, alongside of the Committee on Research and Standards and the Committee on Administrative Practice. No administrative machinery, however perfect, can function without the right personnel; and, in a field of such diverse specialization as ours, the problem is one of great complexity. Under the chairmanship of W. L. Leathers and W. P. Shepard, this committee has accomplished herculean tasks. It has formulated detailed and precise statements defining the qualifications for health officers and for fourteen different types of specialists in various fields of public health. It set up in 1940 a Merit System Unit in the office of the Association which has undertaken the preparation of examinations to be used by states and cities in the selection of professional public health personnel. The unit has combined the judgment of experts in the various specialties of public health with tested psychological techniques and has prepared, on request, 294 examinations in various fields (including 135 for nurses, 76 for laboratory workers, 53 for engineers and sanitarians, 20 for administrators). These examinations have received an extraordinarily favorable reception.

In 1945 the committee established a program for the accreditation of universities offering the degrees of M.P.H. and Dr.P.H., including the formulation of standards and periodic inspection, and eleven such universities have been formally accredited for this purpose. Since 1945 a useful Vocational Counselling and Placement Service has been provided at headquarters; and the committee is carrying on an active campaign for increasing the inadequate salaries of various types of public health personnel.

The Association has not permitted its proper preoccupation with the improvement of what are now recognized as parts of the standard health program to blind it to the widening health challenges of the future. The appointment of a Com-

mittee on the Hygiene of Housing in 1936 has led to the development of a procedure for the objective and quantitative appraisal of substandard housing which has been applied by health officers from Portland, Maine, to Los Angeles as well as in Hawaii and the Canal Zone; and systematic supervision of dwellings is likely to become a regular function of progressive health departments. The committee is now preparing a series of reports on standards for the housing of the future; and is analyzing the legal relationships of the health department to housing and preparing the basis for a standard housing code.

The most difficult and most challenging problems of public health in the future are those related to medical care. The aging of the population, with the inevitable relative increase in diseases of later life, has brought this problem before us with compelling force; and earlier attempts to separate "preventive" from "curative" medicine have proved obviously unworkable. A subcommittee of the C.A.P. on Organized Care of the Sick had been in existence from 1921 to 1935. In 1937, a new committee was appointed to study the public health aspects of medical care and to coöperate with various associations "in extending public health work to meet modern needs." In 1943, after a period of intensive study and discussion, this group, whose name had in 1943 been changed to Subcommittee on Medical Care, with Dr. Joseph W. Mountin of the Public Health Service as chairman, presented to the parent committee and, in turn, to the Governing Council of the Association "a set of principles expressing the desirable content of a comprehensive program of medical care, the methods of its administration, and the part which public health agencies should take in its operation." As a result, Medical Care in a National Health Program, an Official Statement of the American Public Health Association, was adopted by the Governing Council on October 4, 1944.[9] This report recognized the vital need for a national program of medical care that should make available to the entire population all essential preventive, diagnostic, and curative services of the highest standard, and rendered under conditions satisfactory both to the public and to the medical professions. It pointed out that the public health agencies—federal, state, and local—must obviously carry a major responsibility in administering any comprehensive program of medical care. The Association, by this action, aligned itself with the forces of constructive progress in this field and is in position to render the greatest service in guiding such progress along sound professional lines.

Since 1946 the Subcommittee on Medical Care has had the services of a small, but expert staff; and has recently participated in a joint study of the principles which should govern the care of the chronically ill which has received the joint approval of the American Hospital Association, the American Medical Association, the American Public Health Association, and the American Public Welfare Association.[10]

Two events of general Association history during the past quarter-century have been the establishment of the William T. Sedgwick Memorial Medal Award in 1924, and of the Albert B. and Mary Lasker Awards in 1945. These provisions for the recognition of distinguished service to the cause of public health have proved (as did the Lomb Prizes in an earlier day) of national significance; and the actual awards add greatly to the color of our annual meetings.

This highly condensed review of the past history of the A.P.H.A. may well give us cause for gratification. We owe a deep debt to the founders of 1872 and to the far-sighted leadership which has carried our standard onward to even greater achievement. The list of past presidents (reproduced in this issue of the

Journal) is in itself an inspiration. Stephen Smith, John S. Billings, Henry P. Walcott, G. M. Sternberg, Frederic Montizambert, Samuel H. Durgin, Eduardo Liceaga, Peter H. Bryce, Benjamin Lee, Walter Wyman, Carlos J. Finlay, F. F. Wesbrook, J. N. Hurty, Rudolph Hering, W. T. Sedgwick, C. J. Hastings, Lee K. Frankel, M. P. Ravenel, W. H. Park, George W. Fuller. Here is an honor roll of the finest public health leadership in Canada and Cuba and Mexico and the United States—health administrators, laboratory workers, engineers, university teachers, great public servants. There are a dozen more in later years—of the same distinction—who are still active in the councils of the Association.

The founding fathers set our goal at a human life span of one hundred years; and Stephen Smith, in his own person attained this goal. The century-mark has not yet become the average expectation of life; but in 75 years we have made outstanding progress toward this goal. In 1871 the general death rate of New York City was 28.3; in 1946 it was 10.4—a decrease of 63 per cent. In 1870 Francis A. Walker estimated the average expectation of life at birth in the United States at 39 years; in 1946, it is 65 years—an increase of 67 per cent.

These figures are familiar and we take them as a matter of course. Perhaps the most fundamental task of public education is to make people realize the obvious—to grasp its actual meaning in human terms, with their inner consciousness and not merely with their eyes and ears. If you could stand by the bedside of a man dying at 39 and tell him he could live for 26 years more, that would be recognized as a miracle. Such a miracle has actually happened to the average man in the last seventy-five years. There is no comparable phenomenon in the history of the human race. Wars and depressions are minor and temporary compared with this achievement. It has recently been pointed out that our casualties in World War II (300,000) were more than balanced by reductions in the civilian death rate during the same period. The decline in maternal and infant mortality rates during these years, alone, correspond to a saving of 175,000 lives.[11]

We may well be proud of the past. To the young men and women who may read this editorial, we say "Carry On." The next quarter-century is in your hands.

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Presidents of the American Public Health Association

* Stephen Smith, M.D.....1872, 1873, 1874	* Elisha Harris, M.D..... 1878
* Joseph M. Toner, M.D..... 1875	* James L. Cabell, M.D..... 1879
* Edwin M. Snow, M.D..... 1876	* John S. Billings, M.D..... 1880
* John H. Rauch, M.D..... 1877	* Charles B. White, M.D..... 1881

* Deceased

* Robert C. Kedzie, M.D.	1882
* Ezra M. Hunt, M.D.	1883
* Albert L. Gihon, M.D.	1884
* James E. Reeves, M.D.	1885
* Henry P. Walcott, M.D.	1886
* George M. Sternberg, M.D.	1887
* Charles N. Hewitt, M.D.	1888
* Hosmer A. Johnson, M.D.	1889
* Henry B. Baker, M.D.	1890
* Frederick Montizambert, M.D.	1891
* Felix Formento, M.D.	1892
* Samuel H. Durgin, M.D.	1893
* Emmanuel P. Lachapelle, M.D.	1894
* William Bailey, M.D.	1895
* Eduardo Liceaga, M.D.	1896
* Henry B. Horlbeck, M.D.	1897
* Charles A. Lindsey, M.D.	1898
* George H. Rohe, M.D.	1899
* Henry Mitchell, M.D.	1899
* Peter H. Bryce, M.D.	1900
* Benjamin Lee, M.D.	1901
* Henry D. Holton, M.D.	1902
* Walter Wyman, M.D.	1903
* Carlos J. Finlay, M.D.	1904
* Frank F. Wesbrook, M.D.	1905
* Franklin C. Robinson, LL.D.	1906
* Domingo Orvananos, M.D.	1907
* Richard H. Lewis, M.D.	1908
* Gardner T. Swarts, M.D.	1909
* Charles O. Probst, M.D.	1910
* R. M. Simpson, M.D.	1911
* J. N. Hurty, M.D.	1912
* Rudolph Hering, Sc.D.	1913
W. C. Woodward, M.D.	1914
* W. T. Sedgwick, Sc.D.	1915
John F. Anderson, M.D.	1916
* W. A. Evans, M.D.	1917
* C. J. Hastings, M.D.	1918
* Lee K. Frankel, Ph.D.	1919
W. S. Rankin, M.D.	1920
* Mazÿck P. Ravenel, M.D.	1921
A. J. McLaughlin, M.D.	1922
* E. C. Levy, M.D.	1923
* W. H. Park, M.D.	1924
Henry F. Vaughan, Dr.P.H.	1925
C.-E. A. Winslow, Dr.P.H.	1926
* Charles V. Chapin, M.D.	1927
Herman N. Bundesen, M.D.	1928
* George W. Fuller	1929
A. J. Chesley, M.D.	1930
Hugh S. Cumming, M.D.	1931
Louis I. Dublin, Ph.D.	1932
John A. Ferrell, M.D.	1933
Haven Emerson, M.D.	1934
Eugene L. Bishop, M.D.	1935
Walter H. Brown, M.D.	1936
Thomas Parran, M.D.	1937
* Arthur T. McCormack, M.D.	1938
Abel Wolman, Dr.Eng.	1939
Edward S. Godfrey, Jr., M.D.	1940
* W. S. Leathers, M.D.	1941
John L. Rice, M.D.	1942
Allen W. Freeman, M.D.	1943
Felix J. Underwood, M.D.	1944
John J. Sippy, M.D.	1945
John J. Sippy, M.D.	1946
Harry S. Mustard, M.D.	1947
Martha M. Eliot, M.D.	1948

* Deceased

THE VICTORY OVER MATERNAL MORTALITY

ONE of the most striking achievements in the whole realm of vital statistics is the reduction in the maternal mortality of the United States during the past decade. Between 1915 and 1933, this rate fluctuated between 6 and 8 maternal deaths per 1,000 live births (except for an increase to about 9 in 1918). Since 1933, there has been a steady and continuous decline to a trifle over 2 such deaths per 1,000 live births in 1944 and 1945.

This is a really extraordinary phenomenon. It is difficult to think of any really comparable instance, in which the mortality rate from any particular disease or group of diseases in the United States has been cut by two-thirds in one decade.

Furthermore, it seems difficult to explain that decline on the basis of any fundamental change in general public health policies or techniques. The Children's Bureau and the state and local health departments and the nursing associations and other voluntary agencies have played their part in the happy result; but these agencies have progressed steadily and did not introduce any sudden change of program ten years ago. For so sharp a break in trend, we must look for some new factor.

What did happen in the thirties was the conduct of a series of studies by the

New York Academy of Medicine[1] and by other state and local medical societies of the causes of maternal mortality in routine family and institutional practice; and these studies led to clear and courageous conclusions in regard to the considerable volume of maternal deaths due to faulty obstetrical practice and, particularly, to unnecessary recourse to instrumental delivery. These reports brought about amazingly prompt reform in such practice; and it seems probable that this factor—the one new factor which entered the picture ten years ago—must be given major credit for the results of the past decade. If such be the case, we have here a striking example of an outstanding public health success accomplished largely by the medical profession itself through the leadership of its own professional organizations.

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Clearing House on Public Health Salary Information

EXECUTIVE SALARIES

13 LARGE CITIES

Earl Smith, M.D., Medical Director of the Communicable Disease Control Section of the St. Louis City Division of Health, furnishes the following material based on a questionnaire study of city health department salaries at the executive level in 13 of the largest cities in the United States. By way of caution he says, "It should be emphasized that comparison of an individual city with the average will only indicate whether it is out of line with usual practices and suggest the need for further analysis of operations." It should further be noted that this is a tabulation of maximum salaries.

MAXIMUM SALARIES AT EXECUTIVE LEVEL, THIRTEEN LARGE CITY HEALTH DEPARTMENTS
AUGUST 1, 1947

			Directors of								
City	*Commissioner*	*Deputy Commissioner*	*Tuberculosis Control*	*Venereal Disease Control*	*Communicable Disease Control*	*Child Hygiene*	*Sanitary Engineering*	*Public Health Laboratory*	*Public Health Nursing*	*Public Health Education*	*Vital Statistics*
Detroit	$18,500	$12,000	$9,250	$9,250	$8,650	$9,250	$7,441	$9,250	$6,269	$4,761	$4,285
San Francisco	13,500	7,920	7,200	7,200	7,920	7,920	5,760	4,620	5,520	5,340	3,480
Los Angeles	12,480	8,124	6,540	6,540	6,540	6,540	7,296	6,540	5,280	5,280	3,636
New York	11,000	8,350	7,850	7,850	7,850	7,850	6,350	9,850	7,150	7,850	7,150
Chicago	10,698	9,096	....	6,000	6,954	5,352	....	5,562	3,534	....	4,920
Washington	10,000	9,376	8,059	8,060	6,862	8,060	8,060	6,862	8,060	5,905	4,526
Philadelphia	10,000	4,650	4,800	4,800	5,600	5,600	5,600	5,600	....	....	3,800
Milwaukee	9,600	6,600	5,520	4,920	5,520	5,520	4,200	5,520	3,600	3,600	3,600
Kansas City	8,560	....	4,320*	4,980*	4,980	4,980	5,460	7,740	3,360	2,700	2,700
Buffalo	8,500	7,000	6,000	2,800*	7,000	7,000	5,500	7,000	5,500	3,150	4,000
Pittsburgh	8,000	....	6,500	6,000	5,998	5,467	....	4,115	3,202	....	2,948
Cleveland	7,680	....	6,000	4,680	6,180	6,180	6,180	4,680	4,680	4,680	6,180
St. Louis	7,680	....	5,100	5,100	5,100	5,100	5,100	5,880	4,140	....	3,060
Range of Maximum	18,500	12,000	9,250	9,250	8,650	9,250	8,060	9,850	8,060	7,850	7,150
	–7,680	–4,650	–4,800	–4,680	–4,980	–4,980	–4,200	–4,115	–3,202	–2,700	–2,700
Average Maximum	10,476	8,124	6,620	6,400	6,550	6,524	6,086	6,401	5,024	4,807	4,175
Median Maximum	10,000	8,124	6,500	6,000	6,540	6,180	5,760	5,880	4,980	4,761	3,800

* Part time

PUBLIC HEALTH EPIDEMIOLOGIST SALARIES

Franklin H. Top, M.D., Secretary of the Epidemiology Section of the Association, reports recent action of the Epidemiology Section Council on salaries of epidemiologists as follows:

Cognizant of the difficulties involved in suggesting or determining a salary schedule for epidemiologists which would fit all health units—local state, and federal—the Epidemiology Section suggests the following broad policy on salaries, patterned after the proposed statement by the Executive Board on salaries of public health administrators:

A. Physicians with an M.D. degree from an approved medical school followed by internship plus a master's degree in public health, not less than 2 years of full-time experience under supervision, should receive a minimum annual starting salary which is not more than one step below the minimum annual starting salary of the administrator, namely $1,000 under the minimum annual starting salary of $8,500 suggested for public health administrators with regular increments to a salary level of at least $10,000. Where there is a marked difference between an administrator and/or his deputy and the remaining personnel, the minimum starting salary should be not less than $8,000.

B. Physicians with an M.D. degree from an approved medical school, followed by internship and 2 or more years of successful full-time experience, but without graduate training, should receive an annual starting salary which is *not more* than two steps below the minimum starting salary of public health administrators; namely, $2,000 under the minimum annual starting salary of $8,500 suggested for public health administrators with regular increments, to a salary level of at least $8,000. Where there is a marked difference between an administrator and/or his deputy and the remaining personnel, the minimum starting salary should not be less than $7,000.

C. In the event that a physician lacks the graduate training but has had a particular formal training such as several years on a communicable disease service or success in an allied field together with a number of years of full-time experience in a well organized health agency, he might be considered for a starting salary between the levels of Categories A and B with the suggestion that academic training leading to the degree of Master of Public Health be obtained at the earliest opportunity.

LETTERS TO THE EDITOR

To the Editor:

In reading the publication by Milton I. Levine in the *American Journal of Public Health*, 1947, vol. 37, page 1089, I note several errors which I would greatly appreciate having corrected, especially in view of the wide circulation of the *Journal*. On page 1092 the studies were undertaken on four different reservations and in southeastern Alaska instead of "8 different reservations." On page 1093 the quotation "It is, of course, not possible to be certain that no bias was unintentionally introduced," refers not as Dr. Levine states to our methods of selection but to an evaluation of the results. On page 1095, Table 7, the percentage of positive tuberculin reactions one year after vaccination was not 56 but 93.3 (*Public Health Reports*, 1946, vol. 61, page 810).

See also the following publications:

"BCG Vaccine," Amer. Rev. Tuberc., 1940, vol. 42, page 661.

"The Specificity and Sensitivity of the Tuberculin Reaction Following Vaccination with BCG." Amer. J. Hygiene, 1941, vol. 33, page 45.

"Tuberculosis Control Among the North American Indians." Amer. Rev. Tuberc., 1942, vol. 45, page 49.

I would greatly appreciate your making the above corrections in the near future.

Joseph D. Aronson, M.D.
Assoc. Prof. Bacteriology,
Henry Phipps Institute,
University of Pennsylvania

September 15, 1947

To the Editor:

This is to compliment you upon the excellent article by Bleecker Marquette in the August issue of the *American Journal of Public Health* and also upon the fine editorial in the same issue. I thought you both did a fine piece of work in preparing them.

Since so many people in Washington live in rural areas we are particularly concerned with the development of county health councils, a subject of which Mr. Marquette was not overly optimistic. We have four at present in the state which are really county-wide in scope, and two others which are county-wide in name only. By the end of the month we hope to have off the press a brief pamphlet entitled "Health Councils for Washington," which deals with the rural county health council. I will send you a copy when it is available.

Undoubtedly the development of health councils will be slow, just as full coverage with full-time county health departments, and your support for the idea in the *Journal* will certainly help.

Howard W. Lundy, Dr.P.H.
Head, Health Education Section,
State Department of Health,
Seattle, Wash.

September 9, 1947

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted. All books reviewed in these columns may be purchased through the Book Service.

An Appraisal Method for Measuring the Quality of Housing. Part II. Appraisal of Dwelling Conditions. *New York: American Public Health Association,* 1946. 246 pp. Price, $5.00.

The Committee on the Hygiene of Housing presents Part II of a yardstick for health officers, housing officials, and planners, this contribution, prepared by Allan A. Twichell, being divided into three volumes: (a) survey director's manual, $2.50; (b) field procedures, $1.00; (c) office procedures, $2.00. The broad purposes of a housing survey have been previously presented in Part I, *Nature and Uses of the Method.* A third part, in preparation, will deal with the appraisal of neighborhood environment.

As stated in a foreword by Rollo H. Britten, Chairman, Subcommittee on Appraisal of Residential Areas, these manuals are intended to facilitate a local survey to be undertaken in association with consulting service provided by the committee. It is hoped, however, that such service will encourage the maintenance of a continuous inventory of local housing conditions. The director's manual carries the reader through each detail of the survey, from the organization of the sponsoring community and the preparation of the survey staff, through a description of the appraisal items, to the collection of data, processing of records in the office, to final analyses and interpretations. Nothing has been left to the imagination of the student of survey methodology. Each detail has been presented in elementary school fashion, undoubtedly for the sake of uniformity, understanding, and in order to serve as equipment for the surveyor of limited schooling. It will be interesting to note whether much of the text can be consolidated as more field experience is at hand. The manuals are well done and should prove useful tools for every health administrator and teacher interested in housing, and this should include every one of us. Appreciation is again due to Winslow and the members and able staff of his excellent committee. HENRY F. VAUGHAN

Microbial Antagonisms and Antibiotic Substances—*By Selman A. Waksman. (2nd ed.) New York: The Commonwealth Fund,* 1947; 415 pp. Price, $4.00.

The need for a book like *Microbial Antagonisms and Antibiotic Substances* was well indicated when the first edition of this work went through two printings in the year that it appeared on the market. In this second revised and enlarged edition the table of contents is identical with that of the first edition.

The ecology of the microbic antagonisms native to soil and water is fully discussed in a manner that is logical, clear, and interesting. However, the book attempts to coördinate over a thousand references, and thus appears cumbersome, and in places is stilted and repetitious. Progress in this field is so rapid that almost any book on the subject would be in some respects obsolete at publication. The book can hardly be recommended for its discussions of the chemical and medical aspects of the subject. No reference is made to chemical methods employed for the deter-

mination of penicillin and streptomycin. Frequently references are used without much analysis. It is stated on page 204 that barium salt of penicillin is generally used when common knowledge recognizes barium salt as extremely toxic. On page 206, where the formulae of the penicillins are presented a little addition would give molecular weights from 312-350 instead of the weights 490–510 noted on page 207; the latter are early estimations from an outdated reference. On page 241 Dr. Waksman doubts that streptomycin could be inactivated by blocking a single group, the carbonyl group, in so large a molecule, while larger molecules are known to have been inactivated by merely reversing the direction of optical rotation to a plane of polarized light.

The book, however, contains much information of historical and current interest on antibiotic substances and microbic antagonists; its copious references date from 1863 to 1946. It will be profitably read by the scientific minded person interested in these topics. Experts will find the information useful if regarded critically, and others will be skillfully introduced into the field and brought up to date (1946).

K. F. MEYER

Nutrition in Industry—*By Lionel Bradley Pett, Robert S. Goodhart, and David H. Blelloch, with an introduction by Frank G. Boudreau. Montreal: International Labour Office. Studies and Reports, No. 4,* 1946. 177 pp. Price, $1.50.

The International Labour Office which issues from time to time special reports on subjects which affect industry and labor has performed a real service by publishing in this book accounts of the steps taken in three countries (Great Britain, United States, and Canada) to safeguard the nutrition of industrial workers during the recent war.

The type of warfare of World War II soon made it evident that the outcome would depend as much on the ability to produce and transport vast armaments as on operations in the field. This, in turn, demanded that the health, morale, efficiency, and welfare of industrial workers be maintained at an optimum. In this connection, all three governments developed active nutritional programs.

In addition to contributing to the maintainance of a high level of industrial production and the development of in-plant feeding organization, these programs helped to supply more precise information on the relation of diet and nutrition to health and working efficiency and to the nutritional status of the worker.

The benefits both as to health and to labor-management relationships of this wartime activity are so generally recognized by employer and labor that the provision of an opportunity to obtain meals at the place of employment is rapidly becoming an integral part of the pattern of American industrial society. This book summarizes the experience in this field to date. OTTO A. BESSEY

School Health Problems — *By Laurence B. Chenoweth, M.D., and Theodore K. Selkirk, M.D. (3rd ed.), with an Outline on School Health Administration by Richard Arthur Bolt. New York: F. S. Crofts & Co.,* 1947, 419 pp. Price, $3.00.

This book was first published in 1937 "to acquaint students of education, teachers in service, and others interested, with the broad general nature of health problems in schools." This edition is almost identical with the second edition published in 1940. New treatments and new publications, when mentioned, are given inadequate space. There is only brief reference to Nyswander's work and then only as it relates to the ability of teachers to select children for medical review by the

school nurse or physician. The Wetzel Grid also is inadequately discussed in the text, although a brief description of the technique is given in the appendix.

The chapters on growth are perhaps the best feature of the book. Five chapters dealing with growth and nutrition constitute about a quarter of the publication. A large bibliography accompanies most of the chapters. Unfortunately, many of the references are now more than twenty years old. If the authors would substitute for these older publications recent contributions of significance, the value of the book for new readers would be enhanced.

There is insufficient discussion of rheumatic fever. Some of the medical theory appears dated — for example, abscessed teeth are mentioned as an important factor in the development of heart disease and rheumatic fever. In a publication directed to non-medical workers, the glands of internal secretion are reviewed in too much technical detail and out of proportion to their importance as health problems in school children. The description of epilepsy is unfortunate and will tend to create a more pessimistic attitude among educators with respect to the education of these children.

Teachers, nurses, and others concerned with the school child have need for a volume which will orient them to the health problems of school children. *School Health Problems* helps but does not fully meet this need.

GEORGE M. WHEATLEY

Social Aspects of Public Housing: An Evaluation of North Carolina Experience — *By Sanford Winston. Raleigh, N. C.: North Carolina Council of Housing Authorities,* 1947. 44 pp.

This is the report of a sociological study of 194 white and 112 Negro families who have lived in public housing projects in one or another of 6 different North Carolina cities. All subsequently moved to other homes. Data are presented on family size, occupations of husbands, education of householders, sanitary conditions of dwellings from and into which they moved, and social interests of the group.

It is evident that for this group of families, tenancy in public housing has raised their standard of living to such an extent that they have sought and obtained privately-owned quarters which are far superior to the slums whence they originated.

M. ALLEN POND

The Murine Type of Tubercle Bacillus. (The Vole Acid-Fast Bacillus) — *By A. Q. Wells.* With *Notes on the Morphology of Infection by the Vole Acid-Fast Bacillus—By A. H. T. Robb-Smith. Medical Research Council Special Report Series. No. 259. New York: British Information Services,* 1946, 48 pp. Price, $.70.

A very complete survey of the knowledge to date concerning the vole acid-fast bacillus is contained in this report. A description is given of the disease as it occurs in voles and its similarity to tuberculosis.

Morphologically the bacillus is notably pleomorphic with the majority of the bacilli bent in various forms. It is strongly acid-fast and grows best on media without glycerine. Serologically it is indistinguishable from the human and bovine types. A tuberculin can be prepared from the vole bacillus which gives reactions in animals infected with the human or bovine tubercle bacilli, and animals infected with the vole bacillus show a sensitivity to human and bovine tuberculin.

The pathogencity for various laboratory animals, such as the guinea pig, rabbit, white mouse, golden hamster, and other voles is given. When administered in large doses to laboratory animals it can produce progressive disease indistinguishable histologically from

that produced by the human and bovine types of tubercle bacillus. In view of this fact and its characteristic morphology, cultural needs, and pathogenicity, it must, therefore, be considered as a third mammalian type of tubercle bacillus.

Detailed description of experiments and protocols are given demonstrating increased resistance by vaccination of animals with the vole bacillus to subsequent infection with virulent tubercle bacillus. It is concluded that in man immunization with the vole bacillus has proved to be safe and the local reaction resulting is similar to that following BCG vaccination. Tuberculin allergy following vaccination in man with the vole bacillus is greater and occurs earlier than that following BCG vaccination. It has not so far been possible to evaluate the degree of resistance that can be induced in man.

A description is given by Robb-Smith of the lesions observed in relation to the number of organisms present in different tissues from naturally infected voles, as well as in experimentally infected rabbits, guinea pigs, and white mice. Lesions also produced in the vole by artificial infection with human and bovine type tubercle bacilli are described. Many illustrations accompany the descriptions.

The whole report is given in a conservative manner, which is convincing of the possible application of human vaccination with the vole bacillus. The need for further investigation in this phase is clearly indicated.

FLORENCE B. SEIBERT

Our Rural Communities — A Guidebook to Published Materials on Rural Problems — *By Laverne Burchfield. Chicago: Public Administration Service,* 1947. 201 pp. Price, $2.50.

As its title indicates, this is a source book for those who are dealing with any of the various aspects of rural social problems such as health, welfare, housing, land use, recreation, library service, etc. There is a general bibliography as well as a special bibliography following each of the 13 chapters.

The public health worker will be interested not only in the chapter on medical care and health services, but in the other chapters as well, because taken together, they give a bird's-eye view of the fact that no one of the problems is isolated. Land use, for example, is related to schools and health; local government is related to each of the problems.

The book is interesting for another reason. It originated in the work of a committee of the American Country Life Association following its 1944 conference on farm and rural life after the war. It is thus an illustration of the way in which a group saw its own need and met that need.

MARTHA LUGINBUHL

The Papworth Families: A 25 Years Survey— *By E. M. Brieger. New York: Grune & Stratton,* 1946. 674 pp. Price, $12.00.

This book is a report of the dwellers in the Papworth Settlement, drawn up thirty years after the initiation of that experiment. It analyzes in considerable detail the history of the 142 families, and particularly of the 368 children of these families who were kept under constant supervision while at the settlement.

Although no case of active tuberculosis, and no case of active primary infiltration has been observed in the 108 children born at Papworth, Dr. Brieger admits there is no guarantee against exacerbations in later adult life.

The data are presented in numerous sub-divisions by place of birth of the children, by sputum of the original patient, by size of family, and other factors, all of which provide an invaluable epidemiological reference.

The book contains an interesting historical review of the beliefs held at various times as to the communicability of tuberculosis. The appendix, giving details of the case histories of all families, provides added data which many will value.

Environment, particularly as it affects security and prevention of exposure to massive infection, is, according to Dr. Brieger, the lesson in tuberculosis control taught by the Papworth experiment.

JAMES G. STONE

Standard Methods of the Division of Laboratories and Research of the New York State Department of Health—*By Augustus B. Wadsworth, M.D. Baltimore: Williams & Wilkins,* 1947. 990 pp. Price, $10.00.

This storehouse of information of public health laboratory methods has been an essential reference book in public health laboratories since the publication of the first edition in 1927. In this third edition Dr. Augustus B. Wadsworth culminates a career of thirty-three years of noteworthy contributions to medicine and public health as Director of the laboratories of the New York State Department of Health and brings up to date the procedures and techniques developed during his one-third century as Director of that laboratory. The general format of past editions is retained. Through 75 chapters detailed descriptions are given of all techniques and procedures currently employed in the highly developed and efficient New York State laboratory system.

This edition contains numerous changes and additions. Noteworthy among these is the method for the preparation and use of the new cardiolipin antigen in the serodiagnosis of syphilis, which has been developed in the New York State laboratories since the publication of the second edition. A chapter is added on biologic assay, and numerous changes and additions are to be found in other sections. The appendix provides excerpts from the *State Law and Sanitary Code* relating to laboratories and gives procedures for the submission of specimens. The importance of these latter details is well recognized by all workers in public health laboratories.

The book is well printed and is bound to withstand the hard usage of the laboratory. It is replete with bibliographical references that further enhance its value.

This edition should be available for ready reference in every public health laboratory. It will also be found to be of value to any public health workers who depend upon the laboratory for assistance in the solution of their problems.

MALCOLM H. MERRILL

Tuberculosis Nursing—*By Grace M. Longhurst, R.N. (2nd. ed.) Philadelphia: Davis,* 1947. 358 pp. Price, $3.50.

This second edition of *Tuberculosis Nursing*—which has become a valuable nursing library item—has several new chapters as well as many timely revisions. One chapter titled "Patient Education" is especially helpful. It gives specific suggestions for teaching in relation to many of the factors involved in tuberculosis nursing; it suggests opportunities when this teaching will have its greatest value to the patient and/or his family and it hints of teaching aids which will supplement day-by-day teaching.

The chapters of Case Histories also suggest methods of approach to particular problems which are found repeatedly among tuberculous patients. The detail of "Method of handling the patient and his problem" could have been made more meaningful. A student might profit more from a detailed reporting of the actual, practical plan undertaken than by the statement that

"An appeal has been made to her superior intelligence" or that "a patient of this type needs to be reassured constantly."

In view of the fact that Miss Longhurst feels that nurses should be able to explain the "How, Why and When" of the disease, it seems unfortunate that clinical tuberculosis is not dealt with more fully. An intimate understanding of the qualitative classification of tuberculosis is important—as well as the quantitative classification — if the nurse is to do as intelligent and effective job as we expect. This kind of information would seem to be more vital than the many pages given over to the specifics of procedure and technique. Undeniably the nurse needs to be familiar with the principles of a safe technique but the institution in which she works will no doubt have established procedures.

The recommended readings and questions suggested for review at the end of each chapter are comprehensive and should be useful to the teacher or student of tuberculosis nursing.

ALINE LEMAT

Clinical Practice in Infectious Diseases — *By E. H. R. Harries and M. Mitman.* (3rd ed.). *Written and printed in Great Britain. American Publishers: Baltimore. Williams & Wilkins,* 1947. 679 pp. Price, $4.50.

The authors of this excellent book are medical superintendents of English hospitals who have evidently had extensive clinical experience in the management of the various contagious diseases. Besides 8 introductory chapters on the general principles of infection and of diagnosis, and 4 concluding chapters on the management of infectious diseases under varying circumstances, there are 26 chapters discussing various of these diseases, but there are no accounts of such other contagious diseases as syphilis, gonorrhea, or the common cold. In general, the description of the maladies and of their complications, prevention, and treatment are concise, accurate, and up-to-date; and there are many helpful diagrams, charts, and tables, but no photographs—colored or otherwise—of the actual conditions. Many of the chapters have bibliographies appended but the titles of the references are not given, thereby losing much of the value of such bibliographies. There are a number of minor matters in which British custom and procedure evidently differ from American, but nothing of particular moment was found except the recommendation of codein and barbiturates for acute poliomyelitis — drugs which are contraindicated because of the danger of the patient's stopping breathing during artificially produced sleep. On the whole, the book can be very highly recommended, particularly to medical students.

PHILIP M. STIMSON

Manual for Sewage Plant Operators — *By L. C. Billings, Editor-in-Chief. Austin: Texas Water Works Short School,* 1946. 426 pp. Price $3.50.

The Editor's Preface contains as good an explanatory statement as any in stating, "It (the *Manual*) represents an effort of the State Association to bring together practical knowledge and experience in such co-ordinated form as will serve as a text for instruction to those interested in the operation of sewage plants and sewerage systems." The non-technically trained, operational individual will find this volume particularly useful. Consideration of theory is held to a bare minimum. The *Manual* starts with a discussion of general characteristics and significance of sewage and progresses through the various factors involved in treatment. Technical terms, where used, are explained.

FRANCIS B. ELDER

Statistical Abstract of the United States, 1946—*Compiled under the supervision of Morris H. Hansen, U. S. Department of Commerce, Bureau of the Census. Washington: U. S. Government Printing Office,* 1946. 1,039 pp. Price, $2.25.

This 67th annual edition of the *Statistical Abstract,* like previous editions, contains summary information from important statistical publications in the United States. Thirty-four sections of the volume deal with statistics of area, population, vital statistics, criminology, climate, military affairs, business and finance, industry (including agriculture), public works, transportation and communication, and foreign commerce. Because of the wide scope of the volume, information is largely restricted to data for the nation as a whole and for the states. The material is well annotated, however, so that the user of the *Abstract* can refer to original sources of data for additional detail. Public health personnel will find this volume useful not so much for vital statistics and population data (since they are more likely to use the primary sources for these subjects), but for the occasional use of statistics in other fields and for the "Bibliography of Sources of Statistical Data" at the end of the volume. The *Abstract* is an important adjunct to the library of a statistician working in any field.

EELEN W. JONES

Units in Personal Health and Human Relations — *By Lillian L. Biester, William Griffiths, and N. O. Pearce, M.D. Minneapolis: Minnesota Press,* 1947. 267 pp. Price, $3.50.

Educators who believe that sex education should be part of education for living will welcome this volume. It was prepared as a guide to group discussion and contains basic facts for teachers which will enable them to present material on reproduction and its social factors adequately.

The authors suggest that the material should be integrated with other subjects such as science, home economics, and health education to obtain effectiveness and a wholesome approach.

Teacher training institutions might well use this book for group discussions for those who expect to be guides to youth. The weakness in teaching the subject at the present is the lack of teacher preparation.

References used are sound and the accompanying vocabularies are explained. It is a useful volume.

MARY P. CONNOLLY

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

AMERICA'S NEEDS AND RESOURCES. By J. Frederic Dewhurst. New York: Twentieth Century Fund, 1947. 812 pp. Price, $5.00.

THE CARE AND TREATMENT OF THE ELDERLY AND INFIRM. Report of a Special Committee of the British Medical Association. London: British Medical Association, 1947. 28 pp. Price, $.15.

CALCIUM AND PHOSPHORUS IN FOODS AND NUTRITION. By Henry C. Sherman. New York: Columbia University Press, 1947. 176 pp. Price, $2.75.

CONCISE CHEMICAL AND TECHNICAL DICTIONARY. Edited by H. Bennett New York: Chemical Publishing Co., 1947. 1,055 pp. Price, $10.00.

CITY FINANCES: 1945 (Cities Having Populations over 25,000). Prepared under the supervision of Allen D. Manvel. Washington, D. C.: Supt. of Documents, U. S. Gov. Ptg. Office, 1947. 258 pp. Price, $1.25.

COLLOID SCIENCE—A SYMPOSIUM. By E. K. Rideal, A. E. Alexander, D. D. Eley, P. Johnson, F. Eirich, R. F. Tucket, J. H.

Schulman, M. P. Pertuz, G. S. Adair, G. B. B. M. Sutherland, and R. R. Smith. New York: Chemical Publishing Co., 1947. 208 pp. Price, $6.00.

DENTAL HEALTH PROGRAM FOR ELEMENTARY AND SECONARY SCHOOLS. American Dental Association. Chicago: The Council on Dental Health, 1947. 40 pp.

THE DEVELOPMENT AND CONDUCT OF A MEDICAL CENTER AND HEALTH PROGRAM. Report to Social Security Commission of the Garment Industry. St. Louis: Ross Garrett and Associates, 1947. 75 pp.

DYNAMIC MENTAL HYGIENE. By Ernest R. Groves and Catherine Groves. Harrisburg, Pa.: Stackpole Sons, 1947. 559 pp. Price $3.75.

ELEMENTARY NUCLEAR THEORY. By H. A. Bethe. New York: Wiley, 1947. 147 pp. Price, $2.50.

FATIGUE AND IMPAIRMENT IN MAN. By S. Howard Bartley, Ph.D. and Eloise Chute, M.A. Foreword by A. C. Ivy, Ph.D., M.D. New York: McGraw-Hill, 1947. 429 pp. Price, $5.50.

5,000,000 CASUALTIES ON THE HOME FRONT. By Louise Neuschutz. Foreword by Margate Culkin Banning. New York: Beechhurst Press, Inc., 1947. 184 pp. Price, $3.50.

GENERAL BACTERIOLOGY. By D. B. Swingle, Revised by William G. Walter (2nd ed.). New York: Van Nostrand, 1947. 319 pp. Price, $3.50.

GENERAL ZOOLOGY. By Winterton C. Curtis and Mary J. Guthrie (4th ed.). New York: Wiley, 1947. 794 pp. Price, $4.50.

HANDBOOK OF PSYCHIATRY. By Winfred Overholser, M.D. and Winifred V. Richmond, Ph.D. Philadelphia: Lippincott, 1947. 252 pp. Price, $4.00

HOSPITAL AND HEALTH DEPARTMENT FACILITIES AND NEEDS IN TENNESSEE. Nashville: Department of Public Health, 1947. Chapters I through IV inclusive.

HOSPITAL AND PUBLIC HEALTH RESOURCES IN NEW JERSEY. Trenton: State of New Jersey Department of Institutions and Agencies, 1947. 114 pp.

HOW OUR MINDS WORK. By C. E. M. Joad. New York: Philosophical Library, 1947. 116 pp. Price, $2.75.

AN INTRODUCTION TO PERSONAL HYGIENE. By Laurence B. Chenoweth. New York: F. S. Crofts, 1947. 345 pp. Price, $2.50.

DR. KIRKBRIDE AND HIS MENTAL HOSPITAL. By Earl D. Bond, M.D. Philadelphia: Lippincott, 1947. 163 pp. Price, $3.50.

MEDICAL CARE AND COSTS IN RELATION TO FAMILY INCOME. Selected and compiled by Helen Hollingsworth, Margaret C. Klem and Anna Mae Baney (2nd ed.). Washington, D. C.: Supt. of Documents, U. S. Govt. Ptg. Office, 1947. 349 pp. Price, $1.25.

THE METROPOLITAN LIFE. By Marquis James. New York: Viking Press, 1947. 480 pp. Price, $5.00.

ON HOSPITALS. By S. S. Goldwater, M.D. New York: Macmillan, 1947. 395 pp. Price, $9.00.

POSTWAR PROBLEMS OF MIGRATION. Papers Presented at the Round Table on Population Problems at the 1946 Conference of the Milbank Memorial Fund October 29–30, 1946. New York: Milbank Memorial Fund, 1947. 173 pp. Price, $1.00.

THE PRACTICAL NURSE. By Dorthy Deming, R.N. New York: Commonwealth Fund, 1947. 370 pp. Price, $3.00.

PROBLEMS OF EARLY INFANCY. Transactions of the First Conference March 3–4, 1947, New York, N. Y. New York: Josiah Macy, Jr. Foundation, 1947. 69 pp. Price, $.75.

PSYCHIATRY FOR EVERYMAN. By J. A. C. Brown. New York: Philosophical Library, 1947. 247 pp. Price, $3.00.

PUBLIC HEALTH LAW. By James A. Tobey, Dr.P.H. (3rd ed.) New York: Commonwealth Fund, 1947. 419 pp. Price, $4.50.

A PUBLIC HEALTH SURVEY OF SARATOGA COUNTY, NEW YORK 1945–1946. By Gertrude E. Hodgman, R.N. Saratoga Springs, N. Y.: Saratoga County Tuberculosis and Public Health Association, 1947. 136 pp.

READING AND VISUAL FATIGUE. By Leonard Carmichael, Ph.D. and Walter F. Dearborn, Ph.D. Boston: Houghton Mifflin, 1947. 483 pp. Price, $5.00.

SPEECH CORRECTION FOR PARENTS AND TEACHERS. By Williard M. Wood. Watertown, N. Y.: The Watertown Press, 1947. 109 pp. Price, $2.75.

THE SHIP'S MEDICINE CHEST AND FIRST AID AT SEA. Joint Project of the U. S. Public Health Service and the War Shipping Administration (rev. ed.). Washington, D. C. U. S. Govt. Ptg. Office, 1947. 498 pp. Price, $3.50.

TELL GIRLS WHY. By Helen McLarin Blackwelder. Atlanta: Turner E. Smith, 1947. 98 pp. Price, $1.75.

TRAINING IN CLINICAL PSYCHOLOGY. Transactions of the First Conference March 27-28, 1947. New York, N. Y. New York: Josiah Macy, Jr. Foundation, 1947. 88 pp. Price, $1.50.

VOLUNTARY PREPAYMENT MEDICAL CARE PLANS. Council on Medical Service (rev.) Chicago: American Medical Association, 1947. 93 pp.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Diphtheria Can Be Eliminated, It Says Here—Diphtheria deaths continue to increase. New England cities had the worst record, those in the East South Central group of states the best.

ANON. Diphtheria Mortality in large Cities in the United States in 1946. J.A.M.A. 134, 18:1540 (Aug. 30), 1947.

Despite Skeptic's Opinion—This committee seems to have produced a thorough-going re-statement of the whole rabies control story. Probably the one finding that will stick in your crop is the assurance that earlier doubts about the efficacy of canine vaccines can now be laid to rest. The extreme ultra-violet irradiated vaccine really does the trick, they assure us. There are eleven recommendations for rabies control proposed by the committee.

ANON. Control of Rabies. Pub. Health Rep. 62, 34:1215 (Aug. 22), 1947.

Coöperative Planning Is Their Answer—Thumbing through the abstracts of eight viewpoints on the matter of school child health leaves the impression that the Canadian-USA border separates few differences in the overall administrative problems or in the usual community deficiences in meeting them.

AMYOT, G. F., *et al.* School Health Services. Canad. Pub. Health J. 38, 8:361 (Aug.), 1947.

The Need Is Indisputable—Milwaukee, Detroit, Los Angeles, and Baltimore Health Departments have made a stab at getting rid of substandard housing and substituting decent human dwelling places. Let's see; how many American cities over 100,000 are there?

BOARD, L. M. The Local Health Department Program in Housing. Pub. Health Rep. 62, 37:1327 (Sept. 12), 1947.

Quote—The greatest event in English medicine, the birth of the National Health Service, has passed into history. Gestation was prolonged and often complicated, labor quick and uneventful, and now the baby grows apace. Unquote. For the health people, a new era begins: it is the era of specialism in preventive medicine.

BROCKINGTON, F. Letter from Great Britain. Canad. Pub. Health J. 38, 8:401 (Aug.), 1947.

Papers-of-the-Month—We have at long last an opportunity to cope on a broad, nation-wide scale with America's major public health problem—mental illness. So begins a discussion of the practical measures for the attack. If you are not sufficiently interested in what's to be done to read one of these papers, then you are too parochial minded for your own good.

FELIX, R. H. State Planning for Participation in the Mental Health Act. Pub. Health Rep. 62, 33:1183 (Aug. 15), 1947 (and) The Battle Is Joined. Survey Midmonthly 83, 9:235 (Sept.), 1947.

Slogans De-Watered—Something more is required than cheap, worn out slogans which are unconvincing and untrue, insists this British M. O. H. There really are advantages in breast feeding which are both convincing and true—he says. Incidentally, I wish more American health workers could and

would read the Health Education Journal. It's quite a periodical—and so very British.

GEFFEN, D. H. Science of Breast Feeding. Health Ed. J. 5, 3:101 (July), 1947.

Another Epidemiologic Uncertainty—Textbooks set the incubation period for polio at 6–12 days, averaging 10. These figures are not well established, say the writers. Intervals between apparent exposure and onset vary from 3 to 35 days. Many factors need to be settled before we shall have exact knowledge, they conclude.

HORSTMANN, D. M. and PAUL, J. R. The Incubation Period in Human Poliomyelitis and Its Implications. J.A.M.A. 135, 1:11 (Sept. 6) 1947.

First, Choose Parents With Good Teeth—Children continuously drinking fluoride containing water are protected against caries but the degree of protection varies. Youngsters whose parents have the most dental disease are protected the least. It seems that familial susceptibility must be reckoned with in judging the beneficent effects of exposure to fluorine.

KLEIN, H. The Family and Dental Disease. Pub. Health Rep. 62, 35:1247 (Aug. 29), 1947.

Eight Years After—Evidence is presented here to suggest that people generally are continuing to improve in the matter of prompt action when they suspect cancer. Family physicians are not making comparable progress. In over 80 per cent of the patients studied, a diagnosis of cancer could have been made by the first physician if only he had made a careful history and physical examination. Has public health a bigger job to do here?

LEACH, J. E. and ROBBINS, G. F. Delay in the diagnosis of Cancer. J.A.M.A. 135, 1:5 (Sept. 6), 1947.

Men at Work—Did you know that for twenty years the U.S.P.H.S. has maintained a venereal disease research laboratory on Staten Island? All sorts of interesting studies have been undertaken in the fields of diagnosis, prophylaxis, and therapy.

MAHONEY, J. F. Some Significant Aspects of Venereal Disease Research. Ven. Dis. Inform. 28, 7:129 (July), 1947.

Out of the Mouths, Et Cetera—School Children were asked to list the subjects taught in order of their preferences. Hygiene was promptly condemned to outer darkness, along with grammar and another deadly subject tabbed memory gems. One candid tike wrote, "I dislike hygiene because it is so boring." Brings back your own youth, doesn't it?

MONASH, L. Why Children Dislike School. Understanding the Child. 16, 3:67 (June), 1947.

Barber Shops Spread It Too—When community outbreaks of *Tinea capitis* occur—and they do occur often—half-way measures are not likely to fill the bill. The U.S.P.H.S. control method has nineteen steps, and it works.

SCHWARTZ, L. Public Health Aspects of the Treatment of *Tinea capitis*. New York State J. Med. 47, 16:1782 (Aug. 15), 1947.

In Return for His "Stamp"—In preparation for the (British) National Health Service, local authorities are busily arranging their schemes for home nursing care of the insured public. These services may be given by health department nurses or through arrangement with voluntary nursing associations. Many of us will be curious about the outcome of the different methods.

WATT, K. Public Health Nursing Services in England. Pub. Health Nurs. 39, 9:433 (Sept), 1947.

Educational Job To Do—In this typical community a painstaking survey revealed 3 unsuspected cases of diabetes for every 4 known cases. If the proportion holds generally then diabetes must

be much more prevalent than is commonly assumed. Case finding methods are reviewed.

WILKERSON, H. L. C. and KRALL, L. P. Diabetes in a New England Town. J.A.M.A. 135, 4:209 (Sept. 27), 1947.

First, Be Sure—Today the water works operator uses alum, chlorine, copper, iodine, halozone, iron, metaphosphates, sulfuric acid, carbonic acid, and sulfur to make safe and acceptable community water supplies. It has been urged that, in addition to purification we medicate water supplies with iodine and fluorine. Iodine was tried and abandoned. Fluorine is being added experimentally in a number of communities. Wolman, Geiger, and Morse say that we should wait until the controlled experimentation is completed before going further. Morse suggests that it is questionable economy to medicate 100 gallons of water for the sake of the single gallon the residents will drink.

WOLMAN, A., *et al.* Should Public Water Supplies Be Used for Mass Medication? J. Am. Water Works A. 39, 9:834 (Sept.), 1947.

ASSOCIATION NEWS

OFFICERS, 1947–1948

President, Martha M. Eliot, M.D., Washington, D. C.

President-Elect, Charles F. Wilinsky, M.D., Boston, Mass.

Vice-Presidents:
G. D. W. Cameron, M.D., D.P.H., Ottawa, Ont., Canada
J. P. Fontenelle, M.D., Rio de Janeiro, Brazil
Emilie Sargent R.N., Detroit, Mich.

Treasurer, Louis I. Dublin, Ph.D., New York, N. Y.

Executive Secretary, Reginald M. Atwater, M.D., New York, N. Y.

Chairman of Executive Board, Abel Wolman, Dr.Eng., Baltimore, Md.

New Members of Executive Board:
Estella Ford Warner, M.D., Washington, D. C.
George M. Uhl, M.D., Los Angeles, Calif.

The A.P.H.A. Announces an Increase in Dues

At the Atlantic City Annual Meeting the Governing Council approved amendments to the By-laws providing for an increase in dues for the various grades of membership in the Association. This step was reluctantly taken to meet the rising costs of printing the *American Journal of Public Health* and furnishing other services to members. In recommending the dues increases, the Governing Council took cognizance of the fact that the membership dues have remained at $5 since the Association was established in 1872 and that the Fellowship dues have been kept at $10 since this grade of affiliation was established in 1922.

As of October 10, and effective with the calendar year 1948, the annual dues for members will be $7, for Fellows $12, and for a subscription to the *American Journal of Public Health,* $7. The new rate for Life Membership will be $200.

As a convenience to any members or Fellows who may wish to apply for Life Membership before the new rate goes into effect, the Governing Council ruled that such persons may have until December 31, 1947, to apply. Applications for Life Membership which are received up to that date and accompanied by an initial payment of $25 will be accepted at the $100 rate. Upon applications for Life Membership received in the Administrative Office after December 31, 1947, the new rate will apply.

With the additional revenue that is obtained from the increased dues the Executive Board plans to expand the *American Journal of Public Health* and reëstablish the *Year Book,* absorbing the recent 45 per cent increase of printing costs. In addition, the Board will attempt to meet at least in part the urgent requests for funds from the Association committees dealing with such vital matters as the recruitment and placing of engineers, physicians, and laboratory workers. There are requests for field services of A.P.H.A. staff from coast to coast which would require the entire increase of Association income from the change of dues.

The Governing Council acted on

recommendation of the Executive Board and the Committee on Eligibility after conducting an opinion poll which showed that the reasons behind the change were widely understood by the membership. Among professional societies the A.P.H.A. is unique in having deferred this change until 1948, in which year several similar groups are raising dues a second time.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Shirley Benham, Jr., M.D., M.P.H., 215 W. 14th, Port Angeles, Wash., Health Officer, Olympia Health District

Robert S. Easton, M.D., 609 City-County Bldg., Pittsburgh, Pa., Director, Tuberculosis Control Division, Dept. of Health

Edward J. Fitzgerald, M.D., 65 Ridge St., Glens Falls, N. Y., Health Officer, City of Glens Falls

John M. Huff, M.D., Municipal Bldg., Norfolk, Va., Director, Dept. of Health

Raymond F. Kaiser, M.D., National Cancer Institute, Bethesda, Md., Asst. Chief, Cancer Control, Subdivision, U. S. Public Health Service

R. H. Laning, M.D., Health Office, Amherst, Va., Health Officer

Rodrigue Latourelle, M.D., D.P.H., 7—St. Laurent, Louiseville, Que., Canada, Health Officer, Health Unit

Leonard Maidman, M.D., Wilton, Conn., Health Officer

Perry F. Prather, M.D., Health Dept., Hagerstown, Md., Deputy State Health Officer, Washington County, State Dept. of Health

Rollin A. Raymond, 3733 N. Arkansas, Wichita, Kan., Exec. Secy., Kansas Crippled Children Commission

Paul Richmond, Jr., M.D., 476 Main St., Worcester, Mass., District Health Officer, State Dept. of Public Health

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Merle P. Baker, Ph.D., Dairy Industry Dept., Iowa State College, Ames, Iowa, Teacher of Dairy Bacteriology

Mary Leigh Beach, 1800 N. Edison St., Arlington, Va., Director of Laboratory, Arlington County Health Dept.

Eleanor M. Beckman, 1098 W. Michigan, Indianapolis, Ind., Public Health Trainee, State Board of Health

Albert M. di Gioia, 350 Post St., San Francisco, Calif., Director, San Francisco Polyclinic

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James Zeck, M.A., 128 W. Commerce St., 620 Health Bldg., San Antonio 5, Tex., Exec. Director, City-County Tuberculosis Control Board

DECEASED MEMBERS

Andrew H. Dibble, M.D., Louisville, Ky., Elected Member 1946, Health Officers Section

Judson D. Dowling, M.D., Menton, Ala., Elected Member 1930, Elected Fellow 1936, Health Officers Section

Mary C. Fulton, R.N., Evanston, Ill., Elected Member 1941, Public Health Nursing Section

Mrs. Mary C. Robinson, Yuma, Ariz., Elected Member 1938, Public Health Nursing Section

James E. Wolfe, M.D., Wichita, Kans., Elected Member 1942, Health Officers Section

A.P.H.A. membership application blank on page XXIX.

EMPLOYMENT SERVICE

The following pages present information for those seeking qualified public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

Address all correspondence to the Employment Service, A.P.H.A., 1790 Broadway, New York 19, N. Y., unless otherwise specified.

Positions Available

(Supplemental to list in October Journal)

Health Officer, well qualified for McLean County Health Department, Illinois. Population 73,930 including city of Bloomington (32,900), which is the county seat and health department headquarters. Health department was established in 1945 and at present has a staff of 17 with all positions filled. Starting Salary $7,200–$8,100, depending upon training and experience. Write to R. P. Peairs, M.D., President, County Board of Health, 123 North Street, Normal, Ill.

Sanitary Engineer with sanitary engineering degree and two years' experience in environmental sanitation, or **Assistant Sanitary Engineer** requiring degree but no experience. Write to Civil Service Board, 412 City Hall, Dallas, Tex.

Bacteriologist to be in charge of city public health laboratory. Man preferred. Salary depends upon experience. Apply to Civil Service Board, 412 City Hall, Dallas, Tex.

Pediatrician with special experience in heart disease by the Territorial Department of Health. Beginning salary $600 per month. Write C. Earl Albrecht, M.D., Commissioner of Health, Juneau, Alaska.

Well qualified **Bacteriologist and Serologist** to act as Assistant to Director of State Laboratory; Four years' experience in bacteriology including one year's experience in administrative capacity; college graduate, supplemented by graduate work in science leading to a master's degree in bacteriology or public health; salary $3,840 to $4,800; Civil Service status; retirement; permanent. Apply to: Mr. A. T. Johnson, Personnel Officer, Oregon State Board of Health, 1022 S. W. 11th Avenue, Portland 5, Ore.

Six Health Officers at once. Preferably under 45. Will employ two young medical doctors without public health training or experience at salary of $6,000 plus mileage at 7½¢. Will place on payroll and give some orientation before assigning to counties as local health officers. Also, **two Physicians** with some public health training and experience at beginning salary of $6,300 or $6,600 for well organized health units. Also, need two well trained and experienced men for larger health units at salaries from $6,600 to $8,400. Applicants must be eligible for licensure by Florida Medical Board. Headquarters of these health units are at Lake City, Monticello, Quincy, Bartow, West Palm Beach, and St. Petersburg, Fla. Write or wire Wilson T. Sowder, M.D., State Health Officer, Florida State Board of Health, P. O. Box 210, Jacksonville, Fla.

Sanitarian for modern food handling and restaurant sanitation program. Beginning salary $3,120, annual increments. Car furnished. Position provides for vacation, sick leave, retirement benefits, permanency. For further particulars write Charles A. Neafie, M.D., Director, Department of Public Health, Pontiac 15, Mich.

Veterinarian for modern (quality) milk control program. Beginning salary $3,120, annual increments. Car furnished. Position provides for vacation, sick leave, retirement benefits, permanency. For further particulars write Charles A. Neafie, M.D., Director, Department of Public Health, Pontiac 15, Mich.

1. **Public Health Nurse,** either with public health training or sufficient experience, for Taylor County, Florida. Salary range is prescribed by the Merit System from $175 to $250, depending upon training and experience. Must own car; mileage of 7½¢ per mile allowed. State retirement, state compensation, annual sick leave and annual vacation.

2. **Supervising Nurse** for Taylor and Madison Counties. Salary range from $200 to $275 per month. Communicate with Robert F. Sayre, M.D., Director, Madison County Health Department, P. O. Box 187, Madison, Fla.

Public Health Nurses for generalized program. Salary range $1,680 to $2,820 a year, based on qualifications. Under Merit System, retirement system, vacation and sick leave. Mileage paid at 6¢

per mile. Apply to Dr. Fred G. Pegg, Health Officer, City-County Health Department, Winston-Salem, N. C.

Public Health Laboratory Technician for County Health Department. Must have valid state Public Health Laboratory Technician's certificate or be eligible to apply for same. Salary is $240 a month. Position is permanent and carries County civil service status. Write Civil Service and Personnel Office, Courthouse, San Bernardino, Calif.

Veterinarian. Licensed in Ohio or eligible for reciprocity, to assume, Chief, Division of Dairy & Foods. Meat and fowl inspection, slaughter house sanitation; three lay assistants. Active County-City Department of Health. Prefer candidate having public health experience to assist in coördination of general health education program. Salary open pending qualifications. Write **Box 0-3.** Employment Service. American Public Health Association.

Executive Secretary for Industrial Health Education Program in midwestern metropolitan city. Duties are to promote to industry and organized labor groups a coördinated health education program, on behalf of the official and voluntary agencies in the community and to edit monthly health education bulletin to workers. Project under direction of a management body composed of representatives of industry, organized labor, and the health agencies. Graduation from an accredited college or university, including training and experience in health education, community organization, promotion and editorial skill essential. Salary $4,000–$5,000. Write **Box M-2** Employment Service A.P.H.A.

Associate Bacteriologists: Applicant must have a college degree and one year of training in a State Public Health Laboratory or a School of Public Health and Hygiene. Salary: $2,832–$3,638. Apply State Department of Health, Box 1877, Richmond, Va.

Assistant Bacteriologist for City of Kalamazoo, Mich. To perform bacteriological and serological examinations. College degree with emphasis on science and one year pertinent experience or equivalent combination of training and experience required. Write. Personnel Office, 241 W. South Street, Kalamazoo 9, Mich. Application will be received until further notice.

Sanitary Inspector for City of Manitowoc, Wis. Requirements: Age 25–40, male, high school graduate, must own car. Desired qualifications: College graduate, health department experience, training in milk and dairy manufacture or bacteriology. Salary $2,400 plus car allowance. Applications must be submitted before November 15. Write City Clerk, Manitowoc, Wis.

Registered Graduate Nurses: as ward supervisors. Beginning salary $180. Live in or out. Forty-eight-hour week. Uniforms and laundering of them if desired. Write immediately: Tennessee Department of Public Health. Division Tuberculosis Control, Nashville, Tenn.

Supervising Public Health Nurse and **Public Health Staff Nurse** in Alger-Schoolcraft Health Department in the Upper Peninsula of Michigan. Supervising nurse salary $2,700 plus travel expenses. Staff nurse salary $2,400 plus travel. Liberal vacation and sick leave allowed. Write to Dr. W. J. Broad, Director, Alger-Schoolcraft Hea'th Department, Manistique, Mich.

Several qualified **Public Health Officers** in Texas. Salary range $5,500 to $7,200 per year plus travel allowance. Apply to George W. Cox, M.D., State Health Officer, Austin, Tex.

Applications for position of **Director of the Weld County Health Department,** Greeley, Colo. Require graduation from Class A Medical School with training or experience in public health. Present salary is $500 per month plus travel expense. Please send qualifications in first letter and apply to R. L. Cleere, M.D., Executive Director, State Board of Health, State Office Building, Denver 2, Colo.

Well trained **Bacteriologist** capable of supervising bacteriologists working in state mental institution laboratories, $305–$365 monthly; also bacteriologists to be trained in state health department laboratory for positions in state mental institution laboratories, $190–$245 monthly. Write **Box L-539,** Employment Service, A.P.H.A.

Bacteriologist, male, minimum three years' experience in Public Health Laboratory; college graduate with major in bacteriology, preferably supplemented by courses in science leading to a Master's degree; $270 to begin, advancing to $340; Civil Service status; Retirement. Apply to: A. T. Johnson, Personnel Officer, Oregon State Board of Health, 1022 S.W. 11th Ave., Portland 5, Ore.

Laboratory Technician, male or female; college graduate with major in bacteriology, plus minimum of two years' experience in Laboratory; $200 to begin, advancing to $260; Permanent, Civil Service

status; Retirement. Apply to: A. T. Johnson, Personnel Officer, Oregon State Board of Health, 1022 S.W. 11th Ave., Portland 5, Ore.

Supervisory Nurse, Nursing Education Director, and **Staff Nurse positions** available: City-County Health Department, generalized nursing program. Nursing Education Director, $2,940–$3,240, degree in public health nursing required. Supervisor, $2,520–$2,940, degree preferred. Sr. Staff Nurse, $2,220–$2,400, a certificate or its equivalent. Maximum salary reached in three year period. Forty-hour week, retirement plan, mileage. Write Dr. Geo. A. Denison, Box 2591, Birmingham, Ala.

Supervising nurse for City-County Department of Health. Thriving progressive industrial and agricultural community of 74,000. Staff of nine nurses with promise of more in 1948. New and interesting developments, such as cancer diagnostic clinic, expanding school health program, additional child welfare clinics. Special Venereal Disease and Tuberculosis Clinics. Salary $3,192 plus $600 travel. Address Fred O. Tonney, M.D., Commissioner of Health, Municipal Building, Mansfield, Ohio.

Hawaii Board of Health Wants: One Public Health Statistician to direct the Bureau of health (vital statistics). (Salary: $407.08 to $481.67 plus $25.00 monthly bonus.) Qualifications: Five years of responsible statistical experience, of which three years shall have been of a research and supervisory character in the field of public health, and graduation from a university of recognized standing with courses in advanced statistics, supplemented by one year of graduate work in public health with specialization in public health statistics. Write air mail to: President: Board of Health, P. O. Box 3378, Honolulu 1, Hawaii.

Qualified personnel to serve with Eighth Army in Japan and Korea. Civilian Status. One to 2 years minimum tour of duty. Periodic vacancies for: (1) Physicians as public health officers and welfare officers. (2) Public health nurses. (3) Sanitary Engineers. (4) Laboratory Workers. For information write to: Personnel and Training Branch, Civil Affairs Division, War Department Special Staff, Washington 25, D. C.

Staff Public Health Nurse for generalized program at the Mamaroneck Health Center, Inc. Salary $2,580 per year. Thirty-eight hour work week—car furnished. Apply to Mrs. Genevieve Heatley, President, Mamaroneck Health Center, Inc., 234 Stanley Avenue, Mamaroneck, N. Y.

Dental Hygienists for Child Health Programs. Beginning Salaries $2,168.28-$2,394. Write to: U. S. Public Health Service, Dental Public Health Section, Washington 11, D. C.

Tuberculosis Clinician. Duties include organizing and supervising tuberculosis diagnostic clinics throughout the state, organizing community and industrial x-ray surveys, interpreting x-ray films, and assisting with other related tuberculosis control activities. Must be eligible for West Virginia license. Salary range, $420 to $500 monthly, plus travel. Address inquiries to West Virginia State Dept. of Health, Charleston, W. Va.

Supervisor of Health Education Department needed in Chicago and Cook County Tuberculosis Institute, man preferred. Candidates must have public health background and experience in community education programs. Salary open. Excellent opportunity for developing broad education in tuberculosis control programs. For further information write Dr. E. E. Kleinschmidt, Tuberculosis Institute of Chicago and Cook County, 343 South Dearborn Street, Chicago 4, Ill.

GOVERNMENT OF THE DISTRICT OF COLUMBIA, WASHINGTON, D. C.

Graduate nurses for staff duty in Glenn Dale Tuberculosis Sanatorium located 15 miles from the Nation's Capitol. Salary $2,644.80 per annum. Apply Director of Nursing, Glenn Dale Sanatorium, Glenn Dale, Md.

POSITIONS WANTED

Non-medical administrator, male, age 33, trained and experienced in community organization, program development, rehabilitation, publicity, public relations; at present employed in large state welfare planning and action organization. Interested in position as executive secretary or in related function in voluntary or official health agency. Write **Box A-529.** Employment Service. A.P.H.A.

Chemist, Virologist, B.A., experience

in research on pathogenic viruses (Army Bacteriological Warfare Project), as well as in micro-spectrophotometric vitamin analyses in nutrition survey. Male, single, will travel. Write **Box L-543.** Employment Service. A.P.H.A.

Negro Woman Health Education Worker. Capable of executing an extensive health education program. B.A. degree. 12 years' experience as social worker. 3 years as Health Education Secretary for County Association. Special training in field of Tuberculosis control. Write **Box H-542.** Employment Service. A.P.H.A.

Woman Biologist, M.A., D.Sc., several years' experience in morphology, experimental pathology, interested either academic position or industrial research. Write **Box L-541.** Employment Service. A.P.H.A.

Health Educator, female, experienced in promotion and organization of community activities. Prepared to handle complete details of new program to formulate policies, train personnel, act as liaison between community agencies. B.S. degree in Health Education. Present employment with voluntary health agency. Minimum salary $4,000. Write **Box H-540.** Employment Service. A.P.H.A.

Sanitarian with more than six years' experience in various phases of environmental sanitation inclusive food, water, and insect control desires position. Holds Canadian Public Health Association certificate as Sanitary Inspector. Write **Box E-522.** Employment Service. A.P.H.A.

Sanitary Engineer B.S. 12 years' experience in public health engineering with State and Federal Agencies and Army. Some graduate work; currently on terminal leave; desires position in official agency or private industry; free to travel. Write **Box E-520.** Employment Service. A.P.H.A.

Milk and Food Specialist. Young man with eight years of experience in milk and food sanitation and its allied fields, last five years with U. S. Public Health Service, Master's degree. Desires position as director of division or comparable industrial position. Write **Box M-438.** Employment Service. A.P.H.A.

Veterinarian interested in any phase of Public Health Work, governmental or voluntary. Willing to undergo period of training. Training includes D.V.M. and B.S. degrees, with electives in chemistry, bacteriology, sanitation, animal micrology. Experience: University histology, laboratory, city health department diagnostic laboratory, senior consultant veterinarian, UNRRA. Write **Box V-306,** Employment Service, A.P.H.A.

Licensed Veterinarian: Public health and disease control experience in U. S. and abroad desires position in public health or industry. Write **Box V-308,** Employment Service, A.P.H.A.

Apprentice Training Program for Public Health Nutritionist in New York State

The New York State Health Department announces a new program for the training of public health nutritionists. The objective is "to offer experience under close supervision in the public health field to nutritionists with good academic training but inadequate field experience."

A.B.S. degree from a recognized institution with sound training in human nutrition and one year of graduate work leading to a master's degree represents the basic academic requirement. In addition, it is desirable that workers in public health nutrition have special courses in public health education, community organization and resources, child development, and the making of dietary studies.

It is planned to offer a 12 month period of supervised field service on an annual stipend of $2,500 plus travel allowance. Car desirable but not essential. Write to Senior Nutritionist, Division of Maternal and Child Health, New York State Department of Health, 39 Columbia Street, Albany 7, N. Y.

Advertisement

Opportunities Available

WANTED—(a) Public health nurse of supervisory caliber with knowledge of Spanish to supervise modern health center in Latin America; duties include teaching. (b) Supervisor of nurses; student health department, state university; duties involve preventive treatment and instruction in hygiene; $2,900 including partial maintenance; month's vacation annually. (c) Director, newly created visiting nurse service supported by Community Chest and allied organizations; town of 60,000; $3,600. (d) School nurse; public health training or experience desirable; town of 70,000 short distance from Chicago; $3,100, ten month year. (e) Supervising nurse; county health department, Southern California. **PH11-1** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

WANTED—(a) Young woman with either Ph.D. or medical degree for important faculty appointment; university having highly organized program of professional training in health field; rank dependent upon experience; West. (b) Ph.D. in public health; faculty appointment, western university; duties include teaching public health courses, supervision of campus sanitation. (c) Health educator trained in school of public health; state association; East. **PH11-2** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

WANTED—(a) Physician with administrative ability to direct program of national organization; administrative or public health experience advantageous; should be capable public speaker; $10,000. (b) Young physician with public health background for assistant medical directorship, large teaching hospital; eastern metropolis. (c) Medical officer; public health experience, preferably with rural health program; key position requiring administrative ability; $7,200; Latin America. (d) Medical director; department of health, city of 100,000; duties include directing control of communicable diseases, venereal disease clinic, school health. (e) Physician experienced in student health or public health work for newly created position of assistant medical director, student health department, one of the country's largest universities; preferably one qualified to succeed director upon his retirement within three years; $7,000. **PH11-3** Medical Bureau (Burneice Larson, Director) Palmolive Buiding, Chicago 11.

WANTED—(a) Assistant professor of sanitary engineering; nine month year; $4,000; opportunity for teaching two months during summer which would increase income $1,000. (b) Industrial hygiene chemist; large mining company; West. (c) Sanitary engineer thoroughly experienced in public health work; should be familiar with drainage problems, insect control, water purification; administrative appointment; East Indies. (d) Sanitary engineer to direct Bureau of Mosquito Control; around $6,000; U. S. dependency. **PH11-4** Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago 11.

Advertisement

Opportunities Wanted

Parasitologist; M.S. degree in Public Health; interested in research; fairly recent graduate; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public Health Nurse is available for supervising position; B.S.; certificate, Public Health Nursing; since 1939, public health nursing, principally of administrative character; for further information please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Sanitary and public health engineer; B.S. degree (major chemical engineering); M.S. sanitary engineering and public health administration; several years with State Department of Sanitary Engineering; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Public health physician; A.B., M.D. degrees eastern school; M.P.H. Johns Hopkins; twelve years county health officer, directing generalized public health program; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Dentist who has been successful in private practice for twelve years is available for position with health agency; for five years served as member of state board of dental examiners; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

Health Educator; Ph.D.; several years, instructor nutrition; seven years, director health education, state organization; past several years, associate professor hygiene, state university; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11.

NEWS FROM THE FIELD

THE PRINCETON CONFERENCE ON LOCAL HEALTH UNITS

Representatives of 65 national citizens' organizations met at Princeton University, September 8–10, in a Conference on Local Health Units to discuss practical possibilities and methods of providing adequate public health services for every citizen in the United States. These agencies and their state and local branches represented not less than 50,000 points of public influence and education.

The conference, called by the A.P.H.A. Subcommittee on Local Health Units, provided the first opportunity for representatives of the general public to consider the problem of adequate coverage of the nation by local public health services. An earlier conference in Ann Arbor, Mich., in September, 1946, had been attended by the official administrative officers of the 48 state departments of health. Both meetings were made possible by grants from the W. K. Kellogg Foundation.

As a result of the Princeton conference, the citizen groups called upon the A.P.H.A. to provide immediate guidance and leadership in helping to define health problems and in providing an overall guide for operations of participating organized citizen groups in establishing and strengthening local health services.

The formation of state-wide citizen health groups was recommended to coordinate public participation in programs for community health services in each state. The group also endorsed the necessity for local health councils but stressed the need for professional participation in the planning and activities of these councils.

The opening address of the conference was given by Dr. Haven Emerson, Chairman of the A.P.H.A. Subcommittee on Local Health Units, who declared, "Local government that fails to serve its people by providing basic health services is a failure in democracy."

Dr. Emerson added, "There can be no substance or reality in health organizations at the state, national, and international levels unless the base, the foundation structure, the essential functioning element in all public health service is developed, accepted, and supported at the local or community level."

"Without the framework and organization of local health departments directed and staffed by professionally qualified full-time employees, all private effort and private funds (expended for health purposes) will be largely wasted or will be applied usefully only in those areas where competent local health service is being already provided."

Repeating the findings of the A.P.H.A. survey published by the Commonwealth Fund in 1945 in *Local Health Units for the Nation*, Dr. Emerson told the delegates that 41,000,000 people in the United States are "living in communities which lack full-time, modern, local health departments for providing even the six basic health services considered indispensable . . . It appears that there are approximately 155,000 local government jurisdictions which may, if they wish, set up local health departments in the United States. There are, in fact, some 18,500 such local health departments. There are 3,070 counties in the 48 states. In the opinion of the Committee on Local Health Units of the A.P.H.A.. not more than 1,200 local health departments are needed to cover the nation."

The basic structure and functions of a local health department were presented

to the delegates by Dr. Wilson G. Smillie, Professor of Preventive Medicine and Public Health at Cornell University Medical College. He pointed out that "a local health department is one which is organized to meet adequately the health needs of a governmental unit smaller than the state." Dr. Smillie's presentation was further elaborated in addresses by Dr. T. Paul Haney, Bureau of Maternal and Child Health, Florida State Board of Health, Dr. Mack I. Shanholtz, Division of Preventive Medicine, Oklahoma State Health Department, and by Mrs. O. L. Webb of the Nebraska Statewide Health Committee.

What a local health department is, according to these speakers who represented educators, lay citizens, and local public health administrators, may be summarized in the six items below. Grass roots responsibility arising out of local popular understanding was stressed by each speaker.

A local health department should do at least the following for its community:

1. Keep the facts of births, deaths, sickness, and make them available for use in planning community health programs, school services, industrial health services, and hospital and medical care facilities.

2. Carry out all necessary activities to control communicable and preventable diseases such as tuberculosis, venereal diseases, malaria, hookworm disease, and the communicable diseases of childhood.

3. Supervise the health of the mother and the child from birth through school years, finding the remediable defects of eyes, hearing, teeth, nutrition, and posture, and providing for their correction either directly or through existing community facilities.

4. Supervise the physical surroundings of the community and coördinate the necessary activities for making it favorable to health and well-being. This means providing for clean water, milk, and food, for healthful housing, working conditions, proper sewage disposal, and sanitary recreation facilities, and for safety in home, school, and shop.

5. Provide public health laboratory service both to carry out its own job and to assist practising doctors of the community in diagnosis and treatment.

6. Carry on public health education, making known to the people generally the facts of modern biology and science, and giving instruction in the use of such facts to keep in good physical health.

Dr. Florence R. Sabin, Health Chairman of the Colorado Post-War Planning Committee, spoke on "How Citizens Make Their Wishes Known." Dr. Sabin outlined a recent campaign in which she was active in Colorado which resulted in replacing health laws passed in 1876 with modern legislation. Two conditions are necessary, she said, before reorganization of health services for the people's benefit could be achieved: (1) the people must know the facts about the health and sanitation conditions in their communities, and (2) demonstrations must be given of the exact contributions which preventive medicine can contribute to their lives.

Dr. Sabin added that in Colorado the success of the campaign was due to the activities of organized groups in local communities in informing the public and bringing pressure for legislative action. The people of Colorado were so well informed and so aroused about the public health situation in the state, that their legislative representatives had no choice but to pass the proposed laws and to authorize appropriations necessary to carry out their purposes.

The part that voluntary organizations can play in developing wider public knowledge and demand for modern local health services was presented by two representatives of such organizations, George J. Nelbach of the New York State Committee on Tuberculosis and Public Health, and James G. Stone of the National Tuberculosis Association. Mr. Stone quoted the 1947 platform of the National Tuberculosis Association: "Tuberculosis services to be most effective should be integrated with general community health facilities. To that

end, tuberculosis associations should work to secure the establishment of adequately staffed local health services." He urged the need for this plank in the platforms of other national health agencies.

The great lack of adequate health services in rural areas was emphasized by Dr. Fred Mayes, Director of the Division of Local Health Administration, Kansas State Health Department. The solution proposed was consolidation of several thinly populated counties into public health units, which, although expanded in area and assisted by state leadership, would still be locally operated community agencies. The minimum population that can well support a local health department is 50,000; a larger population when feasible.

Other speakers were Dr. Henry F. Vaughan, Dean, University of Michigan School of Public Health, who discussed "Financing and Staffing of a Local Health Department." He reminded his audience that "health is a purchasable commodity, as essential to man's well-being as food, fuel, shelter, and clothing."

Dr. Joseph McLean, Professor of Government, Princeton University, in a paper entitled "Local Government in Relation to Local Health Service," outlined the complexities of local, state, and federal relationships, both administrative and financial, that must be considered in organizing local activities, health service no less than others. Dr. McLean warned that the process of consolidating municipalities into county or district units in New Jersey and the New England states would be slow but must nevertheless be undertaken. He cited a 1937 study of local government in New Jersey which arrived at the conclusion that most of the official services of government—health, welfare, sewage disposal, fire and police protection, and many others—are best done in population units of at least 50,000.

Dr. G. F. Moench, Hillsdale, Mich., Health Chairman of the National Congress of Parents and Teachers, discussed the ways in which the national agency can get this message to its local branches. Among his suggestions were a clear-cut national program in which local branches can participate, and co-operation between national and local agencies in carrying out a unified community program.

Following the presentation of papers, morning and afternoon, the delegates separated into smaller groups for discussion. An enthusiastic purposeful approach to the problems posed was demonstrated by the four lively discussion periods. Discussion leaders were selected from the invited representatives of the citizen organizations.

The great stress on the necessity for an informed citizenry led to the suggestion that the minimum personnel standards promulgated by the A.P.H.A. be expanded to include a health educator on the staff of each local health unit of adequate size for economical and efficient operation.

The development of model plans by national associations for the promotion of active well informed committes through their state and local affiliations was recommended as a means of developing a strong public opinion in support of local health programs. In developing such model plans, the national citizen agencies proposed that the American Public Health Association develop facilities for furnishing guidance and help to the national agencies.

A word should be said about what one delegate called "the exalted feeling that pervaded the last quarter hour." Bailey B. Burritt, Director of the National Health Council, and Dr. Sabin each summed up some of the aspects of the conference. Said Mr. Burritt, "We have developed not only a new factual appreciation of the necessity for local health units but an awakening of our

emotional appreciation of this fact. However, unless this factual and emotional appreciation leads to action, this conference will not have achieved its main purpose."

Dr. Sabin summed up some of the slogans that had come out of the meeting, such as "We cannot get public health overnight but we should work as if we could," "Adult education is submerged leadership," "Preventive medicine is economically sound," "Public health is public wealth," and finally a quotation from Ralph Waldo Emerson, "What will you have? quoth God. Pay for it and take it."

Following are the resolutions passed by the conference:

Resolution Presented at the National Conference on Local Health Units, by J. S. Jones, Secretary, The Minnesota Farm Bureau Federation:

Public health is public wealth. The greatest actual and potential asset of the United States, of each state and each local unit of government is a vigorous, healthy citizenry. Recognizing the great advances that have been made in preventing unnecessary illness and the maintenance of health, it is still true that there is a wide gap between knowledge and practice in the protection of the health of the people.

This is a problem that concerns every person. It is at once an individual and collective responsibility. The realization of a high degree of health of the people of these United States cannot be achieved while forty-one million persons are residing in areas without the protection of a local health unit manned by a full-time, well trained public health official and sufficient staff to render skilled health services.

This situation has been reviewed thoughtfully by representatives from sixty-five national voluntary organizations in a conference at Princeton, N. J., under the auspices of the American Public Health Association. As a result of their deliberations they are of the unanimous opinion that this is an immediate challenge. The war emphasized the challenge, and now the necessity of organization for a stable future gives it renewed emphasis. The opportunity is great and its achievement practical.

As representatives of these 65 national citizens' organizations we are now prepared to urge upon each such organization the immediacy of this challenge and the great opportunity it offers, and to urge further that vigorous steps be taken by each agency through national, state, and local branches to include in their programs of work completion of health unit coverage of all areas so that at least minimum protection may be given to the maintenance of health of every person.

Motion presented by Miss Ruth Bottomly, Executive Secretary, National Congress of Parents and Teacherss

Moved that the members of the National Conference on Local Health Units request the American Public Health Association to make available in some published form the complete proceedings of the Conference, sending one copy to each agency represented and making others available for purchase.

Motion Presented by Mr. George Nelbach, New York State Tuberculosis and Health Association:

On behalf of the agencies represented at the National Conference on Local Health Units, I move a resolution of thanks to the American Public Health Association for its wisdom and sound judgment for the privilege of participating in this Conference, and also to include in our gratitude Princeton University for making the meeting facilities available and also to the W. K. Kellogg Foundation for the grant of funds to the American Public Health Association which made the Conference possible.

SEWAGE RESEARCH

The Federation of Sewage Works Associations, through its Executive Secretary, W. H. Wisely, announces a grant of $33,830 from the Research Grant Division of the National Institute of Health. "The object of the research will be to evaluate existing methods of analysis of sewage and industrial wastes with respect to dependability and accuracy, and to devise where possible, improvements on entirely new methods . . . The research will be conducted in six selected laboratories, each being

under the direction of a member of the Federation's Standard Methods Committee.

The following laboratories have already been selected for certain phases of the work: Illinois State Water Survey; Mellen Institute; New York State Division of Laboratories and Research; Rutgers University, Department of Sanitation; Wisconsin State Laboratory of Hygiene.

UNITED STATES MAKES ISOTOPES AVAILABLE TO THE WORLD

At the recent fourth International Cancer Research Congress in St. Louis, announcement was made by President Truman lifting the ban against the exportation of radioactive isotopes to scientists of foreign countries. By this action of the United States Atomic Energy Commission, these important research tools became available for medical and biological investigations outside the United States.

The gathering of scientists from 35 countries and its President, Dr. E. V. Cowdry, Professor of Anatomy, Washington University, hailed this message as a "momentous event" of great significance to scientists and to mankind all over the world.

The message also gave impetus to the setting up of a world-wide organization against cancer, a by-product of which it is hoped will be an example in international coöperation in the diplomatic and political fields as well.

Australia was the first nation to avail itself of the privilege of purchasing isotopes. On September 5, 20 millicuries of phosphorus 32 for treatment of an urgent case of a blood disorder, polycythemia vera, were shipped by air to the Commonwealth X-ray and Radium Laboratory of Melbourne.

U. S. SENATE APPOINTS CITIZENS' ADVISORY COUNCIL OF SOCIAL SECURITY

A Senate resolution adopted before the adjournment in July of the Congress and sponsored by Senators Millikin of Colorado and George of Georgia has become effective, providing for a "full and complete investigation" of social security and the various proposals for enlarging the present program. An appropriation of $25,000 has been made to implement the project.

Edward R. Stettinius, Jr., former Secretary of State and now Rector of the University of Virginia, has been appointed Chairman of the 17 man committee. Associate Chairman is Professor Sumner H. Slichter of Harvard University, who is also Chairman of the Research Advisory Board of the Committee on Economic Development.

Dr. Florence R. Sabin of Denver, Chairman of the Denver Board of Health and well known proponent of full-time public health service in Colorado, was made a member of the committee. Other members include Frank Bane, Chicago, Executive Director of the Council of State Governments; J. Douglas Brown of Princeton University; Nelson H. Cruikshank, Director of social insurance activities of the American Federation of Labor; Mary H. Donlon of New York, Chairman of the State Workmen's Compensation Board; William I. Myers of Ithaca, N. Y., Dean of the New York State College of Agriculture, and Emil Rieve, Vice-President of the Congress of Industrial Organizations.

DEGREE CHANGES AT NORTH CAROLINA

The School of Public Health of the University of North Carolina, Chapel Hill, has announced that with the beginning of the school year, September, 1947, the Degree of Master of Science in Public Health will no longer be awarded. The only degrees to be awarded will be the Master of Public Health, the Doctor of Public Health, the Master of Science in Sanitary Engineering, and the Certificate and Bachelor of Science in Public Health

Nursing. The largest group among the students to be affected by the change in degrees will be the health educators, who hereafter will receive the M.P.H. instead of the M.S.P.H.

WHO PUBLIC HEALTH FELLOWSHIPS

Of the approximately 200 fellowships that will be granted to public health specialists for study outside their own countries, 66 have already been provided by the Interim Commission of the World Health Organization. This is the first selection of doctors, nurses, and other public health workers under an exchange program whereby scientists and medical specialists will share in advances of medical knowledge on a world-wide basis.

The first group selected includes 18 fellows each from China and Yugoslavia, 15 from Czechoslovakia, 5 from Finland, 4 from Austria, 3 from Poland, 2 from Northern Korea, and 1 from Greece.

PHYSICIANS ADVISE ATOMIC ENERGY COMMISSION

The appointment has been announced of the Advisory Committee for Biology and Medicine of the United States Atomic Energy Commission which held its first meeting in Washington on September 11 principally to determine how the Commission should spend five million dollars appropriated by Congress for cancer research, and with reference to the head of the Division of Biology and Medicine of the A.E.C. The committee will study the basic policies relating to the medical, biological and health aspects of the Atomic Energy Program. This will include research on possible health hazards in the development of atomic energy and the extension of medical and biological research and development, and on the improvement of coöperative relationships with the Armed Forces and with the U. S. Public Health Service.

Among the members of the committee are Alan Gregg, M.D., Director for Medical Sciences, Rockefeller Foundation, New York, Chairman; Ernest W. Goodpasture, M.D., Dean of the School of Medicine and Professor of Pathology, Vanderbilt University, Nashville, Tenn.; A. Baird Hastings, Professor of Biochemistry, Harvard Medical School, Boston, Mass.; and Joseph T. Wearn, M.D., Dean of the School of Medicine and Professor of Medicine, Western Reserve University, Cleveland, Ohio.

MASSACHUSETTS PUBLIC HEALTH CONFERENCE

A Conference under the sponsorship of the University of Massachusetts, the Massachusetts Public Health Association, and the Massachusetts Department of Public Health, was held in Amherst, September 11–12. Local arrangements were in charge of Professor Ralph L. France of the Department of Bacteriology, University of Massachusetts.

The 2 day session included addresses by Dr. Charles F. Wilinsky, President of the Massachusetts Public Health Association; Dr. Hugo Muench, Harvard School of Public Health; Dr. Vlado A. Getting, Commissioner of Public Health; and by a group of speakers who reviewed developing plans for complete coverage of the state with full-time local health units. Among these were Dr. Alfred L. Frechette, Health Officer of Brookline; Charles A. Freck, Queensboro Tuberculosis and Health Association; Dr. Haven Emerson, Chairman of the Subcommittee on Local Health Units, American Public Health Association; Dr. Hugh R. Leavell, Harvard School of Public Health; and Dr. Reginald M. Atwater, Executive Secretary, American Public Health Association. The dinner session was addressed by Dr. Herman E. Hilleboe, newly appointed Commissioner of Health of New York State.

Other speakers included Dr. John F.

Conlon, Director of Medical Education and Information, Massachusetts Medical Society; Miss Mildred Lant, Assistant Director of Public Health Nursing, New York City Department of Health; Dr. Walter Mallmann, Professor of Bacteriology, Michigan State College; Professor Gordon M. Fair, Harvard School of Engineering; Dr. Geoffrey Edsall, Division of Biological Laboratories; Dr. Alton S. Pope, Deputy Commissioner of Public Health; also Lewis Dodson and Walter Snyder of the National Sanitation Foundation, Ann Arbor, Mich.

Total attendance was about 400. It is anticipated that this will become an annual event, and tentative dates have been set for June 16 and 17 in Amherst in 1948.

HANSEN MEDAL TO PROFESSOR WAKSMAN

During the Fourth International Microbiological Congress held in Copenhagen, Denmark, July 20–26, the Emil Hansen Medal and an award of 5,000 kroner was presented to Professor S. A. Waksman, Agricultural Experiment Station, New Brunswick, N. J., for his studies in the field of the antibiotics. Professor Waksman announced that the money presented would be used for the support of work now being carried out by a Danish graduate student at New Brunswick.

DR. HELMHOLZ HONORED

At the recent International Congress of Pediatrics in New York, Henry F. Helmholz, M.D., Professor of Pediatrics, Mayo Foundation, University of Minnesota, was awarded certificates of honorary membership in the Latin American Division of the American Academy of Pediatrics and in the Sociedade Brasileira de Pediatrics. He also was decorated in the National Order of Merit of Carlos J. Finlay in the grade of Commander from the Cuban Government in recognition of his services in furthering pediatric practice in Latin American countries.

OPPORTUNITIES FOR NAVAL RESERVE MEDICAL OFFICERS

The Naval Air Reserve Training Command, with headquarters at Naval Air Station, Glenview, Ill., has 17 nationally located Naval Air Stations and 4 Naval Air Reserve Training Units at which Naval Reserve Medical Officers may serve on active duty with full pay and allowances and with the privilege of returning to civilian life at any time upon request. Additional details may be obtained from Chief of Naval Air Reserve Training, Naval Air Station, Glenview, Ill.

ONE YEAR OF RAT CONTROL

The monthly news sheet, "Rat Controller," July, 1943, of the St. Louis Health Division, makes special recognition of the completion of the first year of activity of the recently established Rat Control Section. The activities of the Section have been divided among four general services. Emphasis has been placed on education of the public through the Education Service. Actual long-range field control has been divided between the Rat-Stoppage Service and the Rat Eradication Service. The fourth Service, that of Inspection-Enforcement, handles complaints requiring day-to-day activities. A full-time biologist has been added to the staff to conduct biological studies and to keep informed on the presence of murine typhus. All of this work, under the direction of John L. Sadowski, Chief of the Rat Control Section, is an outcome of the Rat Control Ordinance adopted on June 26, 1946. J. F. Bredeck, M.D., Dr.P.H., is Health Commissioner.

TUBERCULOSIS RESEARCH CENTER TO SUPPLY BCG VACCINE

The recent Illinois Legislature authorized the construction and maintenance

of a tuberculosis research hospital in conjunction with the University of Illinois College of Medicine, Chicago. It includes an appropriation of $361,250. The Institute for Tuberculosis Prevention, which will be built on the medical campus and be run in close coöperation with the City of Chicago Municipal Tuberculosis Sanitarium, will supply BCG vaccine for the U. S. Public Health Service, now carrying on a project in Columbus, Ga., for a long-range study of the vaccine. The vaccine, which can be manufactured at a cost of about half a cent per dose, will be distributed to regular health agencies, city, state, and federal, but not on commercial lines.

The Research Foundation Board headed by Park Livingston, president of the trustees of the University of Illinois College of Medicine, Chicago, has been set up to raise additional funds for operation of the Institute.

NEW NUTRITION DEPARTMENT AT NORTHWESTERN UNIVERSITY

Northwestern University and the Spies Committee for Clinical Research will establish in Chicago a center for medical research in the field of nutrition and metabolism. The agreement provides that Tom D. Spies, M.D., Associate Professor of Medicine at the University of Cincinnati, will become Professor of Nutrition and Metabolism and Chairman of a new department in this field in the Medical School of Northwestern University. Following his resignation from the University of Cincinnati, he assumed his new duties September 1, at which time the Spies Committee severed its relationship with the University of Cincinnati.

The agreement further provides that the committee will grant to the university at least $150,000 annually for five years to be used for the expenses of this department and for research carried on under Dr. Spies. The Spies Committee for Clinical Research was organized in 1943. Dr. Spies in 1937 organized, and has since directed, the University of Cincinnati studies in nutrition at the Hillman Hospital Nutrition Clinic, Birmingham, Ala., and this work will continue under his direction.

SAN FRANCISCO COMMUNICABLE DISEASE PRECAUTIONS

Dr. J. C. Geiger, Director of Public Health, City and County of San Francisco, announces that because of the recent transportation of cases of communicable disease into San Francisco by airplane, the following necessary precautions have been suggested and made mandatory as far as San Francisco is concerned:

1. Permission should be obtained for transferral of case
   a. local health authority
   b. state health authority of place of destination
   c. local health authority of place of destination
2. If disease has been recognized or classified as suspected disease, precautions are mandatory,
   A. If spread by contact, attendants should be required to wear surgical gown over clothes, face masks, even goggles. Such garments and materials should be gathered in suitable bags (paper or cloth) and sterilized by autoclave heat or burned in suitable ovens.
   B. The plane itself must be aired thoroughly, interior washed by soap and water, and if disease is spread by insect vectors (mosquitoes, fleas, lice, etc.) additionally sprayed with suitable aersol vapors.
3. Since a case of communicable disease should not travel in a public plane conveyance with other passengers, there is no need for protection of fellow passengers other than attendants.
4. Utensils used by patients should be kept separate and boiled for ten (10) minutes
5. Blankets and other coverings of patient must be sterilized by sunning, by steam and laundering.

6. The airplane crew must avoid contact with patient and attendants. The plane must be fully equipped with proper bed, heating, first aid outfits, drugs, and oxygen.

7. Patients should be moved to and from plane by special ambulances.

8. Airfields attendants must offer all and immediate clearance necessary to proper handling of case

Explanation: The airplane and its value in swiftly and safely moving wounded was amply demonstrated in war II. Similar use of the airplane in civilian life has unlimited possibilities in saving time and reducing mortality from disease and accident. It appears to be a prime necessity in all areas where airport facilities are being so well developed as in San Francisco.

J. C. GEIGER, M.D.
Director of Public Health
City and County of
San Francisco, Calif.

DR. FLORENCE R. SABIN ELECTED HONORARY FELLOW OF A.P.H.A.

At the meeting of the Governing Council in Atlantic City, N. J., on October 8, Florence R. Sabin, M.D., of Denver, Colo., was unanimously elected an Honorary Fellow of the Association in recognition of the extraordinary achievements which she has spearheaded in the public health program of Colorado. Dr. Sabin holds among other honors the Jane Addams Medal for Distinguished Service, the Trudeau Medal of the National Tuberculosis Association, and she is currently the President of the Western Branch of the American Public Health Association and President of the Denver Board of Health. Dr. Sabin, who is a native of Colorado, recently retired as a member of the Rockefeller Institute for Medical Research after an extended career in science. Dr. Sabin was the featured speaker at the Princeton Conference on Local Health Units sponsored by the American Public Health Association, September 8–10.

PERSONALS

Central States

HAROLD S. ADAMS,* has been appointed Director of the Division of Hotel and Resort Inspection, Section of Environmental Sanitation, Minnesota Department of Health, succeeding THEODORE T. WOLD who resigned to enter private business. Mr. Adams will continue to serve as lecturer in the School of Public Health of the University of Minnesota. He was formerly Chief of the Bureau of Environmental Hygiene, Minneapolis Department of Health. He recntly wrote *Milk and Food Sanitation Practice* which was published by the Commonwealth Fund.

JOHN BUXELL,* Engineering Director of the Health Division of the City of St. Louis, Mo., is on leave for a year's study toward a Master's degree in Public Health, at the University of Minnesota, Minneapolis, Minn.

ELIZABETH COLLINS has been appointed Consultant in Nutrition to the Public Health Nursing staff of the Cleveland Division of Health, Cleveland, Ohio.

MARY CATHERINE DONOVAN took charge of the Public Relations Department at the Cleveland Museum of Health, September 1. She has been the Director of Public Relations at Notre Dame College, South Euclid, Ohio, for the past three and one-half years.

CHANGES IN HEALTH PERSONNEL IN KANSAS:

FRED MAYES, M.D.,† Assistant State Health Officer and Director, Division of Local Health Administration, Kansas State Board of Health, has been granted educational leave to complete his work on a Master's degree in Public Health at Harvard University.

THERESA JENNIGES* has been appointed Director of Public Health Nursing Services for the State Board of Health. Her public health experience includes work at local, state, and national levels with the Hennepin County Rural Nursing Services, Minnesota; Instructor, Public Health Nursing, Loyola University; Supervisor, Maywood Teaching Center, Chicago; Associate Public Health Nursing Consultant, U. S. Public Health Service, assigned to South Dakota as Supervising Nurse and Senior Assistant Nurse Officer (R) assigned to Oregon and Georgia State Health Departments.

VERNON M. WINKLE, M.D.,† formerly Assistant Health Officer of the Topeka City-Shawnee County Health Department, Kan., has been appointed Acting Director of the Division of Local Health Administration in the absence of Dr. MAYES.

A. B. ROSENFIELD, M.D., M.P.H.,† has been appointed Director of State Health District No. 6, comprising 7 of the counties of Minnesota, with headquarters in Minneapolis. He was formerly Director of School Health of the Hibbing, Minn., public schools.

LEONA RUBBELKE† and RUTH ANDERSON have been appointed respectively as Nursing Consultant in Maternal and Child Hygiene and as Nursing Consultant for the Hospital Construction Program of the North Dakota State Department of Health.

Eastern States

PAUL BENJAMIN recently resigned as Secretary of the Pennsylvania Charities Association to become Executive Secretary of the Related Activities Council of Schenectady, N. Y. He has been succeeded in Pennsylvania by HUGH JACKSON, who has had experience with a number of social agencies, the New York State Charities Aid Association, UNRRA, and, most recently, the National Social Welfare Assembly.

ELLIS H. CHAMPLIN,† who has been serving as Acting Director of the Division of Health and Physical Education of the New York State Education Department in Albany since 1945, has been appointed Director of the Division effective September 11. Mr. Champlin was formerly Chief of the Bureau of Physical Education in the Division he now directs.

LOUIS L. FELDMAN,† who before his recent military service was on the staff of the Committee on Administrative Practice, American Public Health Association, has been appointed underwriter and assistant to the general manager of the Health Insurance Plan of Greater New York.

S. S. LIFSON* has been appointed Assistant Director, Community Organization, of the National Health Council, New York, N. Y. Mr. Lifson was formerly Health Education Consultant with the U. S. Public Health Service, District 1, New York, N. Y.

CLARICE LEAVELL PENNOCK, on September 1 began her duties as Secretary of the National Conference on Family Life. She was formerly Executive Secretary of the Association of Junior Leagues of America, New York, N. Y.

HENRY B. MAKOVER, M.D.,† formerly Senior Surgeon, U. S. Public Health Service, and recently Associate Director of Montefiore Hospital for Chronic Diseases, New York, where he surveyed the possibilities of, and recommended a plan for, a hospital group-practice unit, has assumed the post of health and medical consultant to the Federation of Jewish Charities of Philadelphia, Pa.

JEROME S. PETERSON, M.D.,* on a year's

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* Fellow, A.P.H.A.
† Member, A.P.H.A.

leave of absence as District Health Officer of the New York City Department of Health, returned to China on September 1 to serve as epidemiologist for the World Health Organization. His work will be mainly concerned with the study and control of cholera, bubonic and pneumonic plague, and kala-azar. For 10 months last year he served with the UNRRA as Chief Medical Officer in China.

BERTRAND E. ROBERTS, M.D.,† after 25 years' service in the New York State Department of Health retired recently. With the department since 1922, he was first epidemiologist and for the past 17 years District State Health Officer in the Poughkeepsie area.

NELSON W. STROHM, M.D.,† has been appointed Director of Tuberculosis Control in the Buffalo, N. Y., Department of Health. He has been associated with the chest clinic of the Division of Communicable Diseases of the Buffalo Health Department since 1919, and since February 1 of this year has been chief of the diagnostic clinic of the health department.

JESSIE TURNBULL, Administrator of Elizabeth Steel Magee Hospital, Pittsburgh, Pa., was elected the first woman President-Elect of the American College of Hospital Administrators at its 13th annual meeting, September 22, at St. Louis, Mo.

Southern States

RICHARD B. BLACKWELL, M.D., who has assumed the duties of Health Officer of Rockbridge County, Va., succeeds ROBERT P. COOKE, M.D., who retired after serving 20 years as Health Officer. Dr. Blackwell recently retired from the navy after 30 years of service.

CLARENCE L. GUYTON, M.D.,† has resigned as Director of the South Carolina State Board of Health Division of Venereal Disease and Cancer Control and accepted the appointment of City Health Commissioner at Greenville, S. C. Dr. Guyton organized and developed the state's cancer control program.

SAMUEL J. HAWKINS has been loaned by the U. S. Public Health Service, District 2, Richmond, Va., to the Bureau of Venereal Disease Control, West Virginia State Department of Health, as Field Epidemiologist.

JAMES G. MILLER, M.D., Chief of the Clinical Psychology Section of the neuro-psychiatric division of the Veterans Administration, Washington, D. C., has been appointed Chairman of the Department of Psychology at the University of Chicago, Chicago, Ill. Effective January 1, 1948, his appointment carries the rank of professor of psychiatry and psychology.

LEWIS J. MOORMAN, M.D., one of the founders and for the last 29 years president of the Oklahoma County Health Association, has been made "honorary president for life" of that organization. He assisted in the organization of the Oklahoma City Tuberculosis Society and was the first president in 1918.

W. PHILLIPS PALMER† assumed his duties as Consultant in Administration and Public Relations with the West Virginia State Department of Health, September 1.

EVELYN T. STOTZ, former Lieutenant Commander in the U. S. Navy Nurse Corps, has been appointed Nursing Director of the National Blood Program of the Amreican National Red Cross, Washington, D. C.

GENEVA K. WATSON,† for 17 years a teacher in the Charlottesville, Va., schools, has been appointed by the Virginia Tuberculosis Association to supervise health education services in

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* Fellow, A.P.H.A.
† Member, A.P.H.A.